DOCUMENT RESUME

ED 042 305 EC 006 155

AUTHOR	Rhodes, Leanne; And Others
TITLE	A Language Stimulation and Reading Program for Severely Retarded Mongoloid Children: A Descriptive Report. California Mental Health Research Monograph No. 11.
INSTITUTION	California State Dept. of Mental Hygiene, Sacramento. Bureau of Research.
PUB DATE	69
NOTE	113p.
EDRS PRICE	EDRS Price MF-$0.50 HC-$5.75
DESCRIPTORS	Enrichment Programs, *Exceptional Child Education, Institutional Environment, Intellectual Development, *Language Development, Language Instruction, Language Skills, *Mentally Handicapped, *Mongolism, Program Descriptions, Reading Instruction

ABSTRACT

A longitudinal research study of the growth and development of 10 severely mentally handicapped mongoloid (Down's Syndrome) children reared together in a state hospital was conducted. They were tested regularly on the same scales, providing comprehensive histories of mental, psychomotor, and physical growth. When comparison with similar children reared at home emphasized the declining developmental patterns of the institutionalized group, an environmental stimulation program (eventually including reading) was designed to overcome their relative retardation. Intensive language stimulation training was the focal point. Described are means used to make the environment more stimulating, better structure daily routine, and motivate staff. Initial language stimulation and articulation training is outlined, including modifications made as the program progressed. Aspects of reading training and instruction are summarized. Findings thus far show improvement in articulation, greater expressive use of language, more extensive receptive language, significant increase in intellectual ability, and ability to read and enjoy simple books. Asocial behaviors have almost disappeared and destructive, random, or stereotyped acts have decreased. (KW)

ED0 42305

California
Mental Health
Research
Monograph

No. 11

U.S. DEPARTMENT OF HEALTH, EDUCATION
& WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

A LANGUAGE STIMULATION AND READING PROGRAM FOR SEVERELY RETARDED MONGOLOID CHILDREN:
A Descriptive Report

by

LEANNE RHODES, MA
BILL GOOCH
ELLEN Y. SIEGELMAN, PhD
CHARLENE (ALTON) BEHRNS, MEd
REVA METZGER, BA

Compliments of
Scientific Publications
Bureau of Research
California Dept. of Mental Hygiene

State of California
Department of Mental Hygiene
Bureau of Research

EC006155E

ED0 42305

State of California

Department of
Mental Hygiene

Research Monograph No. 11
1969

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY Calif. Dept. of Mental Hygiene, Bureau of Research TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE U.S. OFFICE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

A LANGUAGE STIMULATION AND READING PROGRAM FOR SEVERELY RETARDED MONGOLOID CHILDREN:

A Descriptive Report

by

LEANNE RHODES, MA
BILL GOOCH
ELLEN Y. SIEGELMAN, PhD
CHARLENE (ALTON) BEHRNS, MEd
REVA METZGER, BA

ALDEN B. MILLS
Editor

California Mental Health Research Monographs and *Symposia* report the findings, conclusions, and opinions of career or project research personnel of the Department of Mental Hygiene based upon their work or papers presented at symposia convened under departmental auspices. Some *California Mental Health Research Monographs*, such as this one, describe projects which combine demonstrations with research. They may be undertaken by persons who are not career or project research personnel but who work closely with the research people at the institution. Each monograph or symposium represents the views of its author or authors and not necessarily those of the Department of Mental Hygiene, of the participating institution with which the authors are connected, or of the editor.

The Editor

Copyright 1969 by the Bureau of Research
California Department of Mental Hygiene

Library of Congress Catalog Card Number: 77-627815
Published July 1969

FOREWORD

Nancy Bayley, Ph.D.

Institute of Human Development, University of California

Berkeley, California

An understanding of the processes of mental growth requires meticulous studies of these processes from many different orientations and as they occur in many different populations, both normally healthy and variously deviant.

In this report the population studied is a small sample of uncomplicated mongoloid (Down's Syndrome) children. Although the experimental group consists of only ten children, it is unique in several ways that make its contribution to our knowledge of mental growth valuable. The children have lived together as a unit for all but the first two to four months of their nine years in an institution with a relatively controlled and well-documented environment. Because they have been tested frequently at regular intervals on the same scales, the histories of their mental, psychomotor, and physical growth are unusually complete. Furthermore, when their relative retardation was dramatized by comparison with a similar group of children who were reared in their own homes, a training program designed to overcome the "institutional" retardation was developed. The program has been remarkably effective.

This report is the story of the training program, its history, its aims, its methods, and its outcome to date. It is presented here in the belief that the application of these methods to institutionalized retarded children, among others, may have widespread practical usefulness. It should not only improve the self-sufficiency of the children, but also make much more appropriate use of the abilities and time of the caretaking personnel. At least in this instance the morale of both the children and the caretakers has been greatly enhanced.

PREFACE AND ACKNOWLEDGMENTS

This report grew out of a longitudinal research study of the growth and development of a group of ten severely retarded mongoloid (Down's Syndrome) children reared in the research unit of Sonoma State Hospital, Eldridge, California. It tells of our efforts to intervene, by means of an environmental stimulation program, in the declining developmental patterns of this group of mongoloid children and describes the environmental stimulation program.

As for the authors of this report, their various roles can be described as follows:

Leanne Rhodes, MA, developmental psychologist and project coordinator, and Bill Gooch, social research analyst, Research Department, Sonoma State Hospital, were responsible for the origination and operation of this research program.

Ellen Y. Siegelman, PhD, research psychologist, Psychology Department, University of California at Berkeley, was responsible for the organization and writing of this report and for imbuing it with the perspective of a developmental psychologist.

Charlene (Alton) Behrns, MEd, practicum coordinator, College of Education, Special Education Department, University of Washington, Seattle, Washington, played a primary role in the establishment of the program and has periodically served as consultant throughout the two and a half year history of the project, making significant contributions to all of its phases, but particularly in the areas of language development and articulation correction.

Reva Metzger, BA, teacher of the mentally retarded, Eldridge School, Sonoma State Hospital, over the past year and a half has cooperated in a creative manner in the furthering of the original aims of the enrichment program and has played a major role in the development of the reading program.

Such a report does not come about as the result of the labors of a few individuals. Rather, it results from the complex interaction of a large number of individuals and groups. We therefore wish gratefully to acknowledge the indebtedness which we feel to all of these many groups and individuals.

Nearly all the research personnel who have been affiliated with the project since the children entered the hospital in 1959-1960 have received financial support in part or in whole from the Bureau of Research of the Department of Mental Hygiene. Such support is gratefully acknowledged.

Sonoma State Hospital administrations, both past and present, are deserving of a large measure of thanks, for without the active concern and cooperation of this institution none of the work reported herein could have taken place. The contributions made by the hospital have been numerous. Specific recognition is warranted for the hospital's provision of space in which to conduct the research and of increased staffing levels

to provide for the care of these children and the other research subjects (with whom both staff and space are shared) utilized by the research department.

Also deserving of a large measure of thanks and recognition are those many researchers whose past efforts to maintain the longitudinal nature of this project made possible the work reported in this monograph. These individuals are: Lawrence E. Dameron, PhD; Dorothy H. Eichorn, PhD; Donald J. Stedman, PhD; Jacqueline L. Griffin, PhD; and Jane V. Hunt, PhD.

To Dr. Nancy Bayley, for several years (including the time period covered by this monograph) the primary investigator on this research grant, go our heartfelt thanks for giving us the benefit of her wisdom, her experience, and her staunch support. Without her, this report would not have been possible.

We wish to give specific thanks to Charles M. McKean, MD, Chief of Research, Sonoma State Hospital, for his general administrative support and direction.

Thanks and appreciation are extended to Marilyn M. Marcus, PhD, Sonoma State Hospital staff psychologist and Chief of the Research Department's Developmental Psychology section, for the administrative assistance and direction she has provided in her role as principal investigator on this project since Dr. Bayley's retirement.

For their administrative assistance and direction we wish

specifically to thank the following personnel of Sonoma State Hospital:

John S. Robinson, PhD, Research Psychologist
Donald A. Bramwell, MD, Former Superintendent and Medical Director
Joseph E. O'Neill, MD, Medical Director

For their cooperation and educational assistance we wish to thank:

Paul Thormahlen, EdD, former principal, Eldridge School, Sonoma State Hospital
Isabelle Steinke, MA, principal, Eldridge School
Harmon Lawrence Thompson, MA, former principal, Eldridge School
Gerald Fields, MA, teacher of the mentally retarded, Eldridge School
Frank Breaker, MA, teacher of the mentally retarded, Eldridge School
David Collins, MA, Speech Therapist, Eldridge School

Nursing service personnel provide the backbone and the labor without which no project of this type could ever be conceived. We therefore extend our thanks and our appreciation to senior psychiatric nurses Betty Muehl and Elizabeth Grantham, each of whom, in the capacity of charge-nurse, has been responsible for the overall administration of the ward, and to all the psychiatric technicians who have participated in this project during the past two and a half years. In the order of length of involvement in the enrichment program the latter are:

Mary Nourse, Elsa Wagner (psychiatric technician I), Goldie Dew, Marie Clark, Mae Barker (psychiatric technician I), Mavis Bligh, Ann Mowry, Jane Pinole, Claudia Rehart, Rosemary Schmidt, Aloha Ball, Elva Morton, Barbara Larimer, Bessie Benzon, Priscilla Diane Bayley, Barbara Mintner, Marge Martin, Eugenia Weyhe, Reginald Copening, Mimi Morton, Dorothy Bennet, Myrtle Humiston, Mikiko Kawamura, LuEllen Myers, Billee Shand, and Bernice Wright.

We wish to thank and express our appreciation to the families in the comparative group for their long contimued cooperation and assistance in the collection of the comparative data, for it was the information contained in this data which led to a recognition of the need for the work described in this report.

For their diligence and hard work we wish to extend special thanks to secretarial staff members Eunice DeGiglio, Ilona Mayer, Ruth Aide, and Carol Newton. Special thanks are also extended to Mrs. Lois D'Amico for her many helpful comments and editorial suggestions.

Leanne Rhodes, MA
Bill Gooch
Ellen Y. Siegelman, PhD
Charlene (Alton) Behrns, MEd
Reva Metzger, BA

Sonoma State Hospital
Eldridge, California
August, 1968

A LANGUAGE STIMULATION AND READING PROGRAM FOR SEVERELY RETARDED MONGOLOID CHILDREN: DESCRIPTIVE REPORT

Table of Contents

Foreward - Nancy Bayley, Ph.D. iii
Preface and Acknowledgments v
Description of the Program 1
The Mongoloid Project as Originally Conceived 5
Assumptions Underlying the Language Stimulation Program 14
Making the Environment More Stimulating: Guidelines for Management 21
The Initial Language Stimulation and Articulation Training 24
Correcting Articulation 27
Contimuities and Modifications in the Program 31
Reading Training: The Background and Construction of Materials 38
Teaching Reading: The Next Logical Step 42
Group and Individual Instruction on the Ward 49
Comprehension and its Assessment 54
Results 57
Training and Motivating of Personnel 65
Accomplishments and Prospects 72
References 78
Appendix A 81
Appendix A-1 82
Appendix A-2 83
Appendix B 84
Appendix C 85
Appendix D 86
Appendix D-1 90
Appendix E 94
Figure 1 96
Table 1 97
Table 2 99
Table 3 100
Table 4 101
Table 5 102

DESCRIPTION OF THE PROGRAM [1]

Introduction

The demonstration project described herein is a child of the times. Such an intensive attempt to enrich the environment of a group of severely retarded institutionalized children would have been unimaginable only a decade ago. This Sonoma State Hospital project is the outcome of a series of events in which a group of people pooled their skills to meet felt needs. But in a larger context, the project is the outcome of a new way of looking at human intellectual capacity. This change is reflected in a growing body of research by men like Hebb, Rosenzweig, Riesen, Forgus, and others on early sensory deprivation and enrichment in animals and humans; by Piaget and his co-workers on the importance of encounters with the environment in the development of intellectual schemata; by Harlow and others on learning to learn; by Bayley and others on critical periods and the fluctuation of the IQ. As

---

[1] Supported by the State of California Department of Mental Hygiene, Division of Research, Project Numbers 63-16-23, 64-16-23, 65-16-23, 66-16-23, 67-16-23, and 68-16-34.

J. McV. Hunt summarizes this trend in his integrative volume, Intelligence and Experience (1961):

> For over half a century the leading theory of man's nature has been dominated by the assumptions of fixed intelligence and predetermined development. These beliefs have played a large role in psychological theorizing and investigation; they have provided a conceptual framework for the measurement of intelligence and for accounting for the development of human abilities, which have been regarded as the unfolding of capacities almost completely predetermined by inheritance. Recently, however, a transformation has been taking place in this traditional conception of intelligence and its relationship to experience. Evidence from various sources has been forcing a recognition of central processes in intelligence and of the crucial role of life experience in the development of the central processes.
>
> (Hunt, 1961, p. v)

Against the old notion of fixed intelligence, evidence has been adduced from quarters as diverse as the animal laboratory, the nursery, and the computer center to suggest that intelligence is more appropriately conceived as embodying information-processing strategies that develop as the child interacts with his environment.

Indeed, environmental changes have been shown -- in animals, at least -- to result in changes in biophysical structures and in the hormonal activities of neurons.

Following in the wake of such findings, practitioners have advocated various versions of the so-called "therapeutic curriculum" designed to provide the environmental nutriment lacking for groups with specific deprivations (for example, the Head Start program; the work of Deutsch (1964) with the culturally disadvantaged; and the program of Kirk (1958) for early training of the mentally retarded).

Enrichment programs for the mentally retarded are not new. However, a direct and intensive program has not to our knowledge focused previously on a single diagnostic group which offered such initially poor prognosis for learning in the institutional setting. (Thus, for example, the widely cited Kirk study (1958) included very few subjects as "severely retarded" as the Special Projects' mongoloid children in the present study; moreover, the improvement rate in the organic group generally was rather discouraging.)

So far as can be determined, then, this work with the Special Projects' mongoloid children at Sonoma State Hospital represents the first attempt to carry on intensive language stimulation training with a group of institutionalized mongoloids. Children with Down's syndrome have been given supervised play opportunities or nursery school training (see, for example, Tizard, 1960); home-reared mongoloids have not infrequently been trained in language use (the progress of home-reared mongoloids at the Walpert Center for the Retarded in Hayward, California, in fact, served as the spur to the present project). But a variety of circumstances appears to have ruled out intensive language training for institutionalized mongoloids. First there has been the widespread feeling that such children are too severely retarded to profit from such training, except in rare cases with especially propitious environments and private instruction (Seagoe, 1964, presents the diary of a specially advantaged mongoloid). In general, such patients have been regarded as trainable, but not educable.

Furthermore, institutionalization itself is held to impoverish still further the environment of the already intellectually deprived mongoloid child. The conditions for intervention, then, would seem to be particularly inauspicious, the expectation traditionally being that a great outlay of staff time would be required with the chance of minimal results.

The staff members who have worked with these children at Sonoma have taken a different view in that the fact of institutionalization has been seen not only as providing the impetus for change but also as offering some possible advantages in terms of a controlled environment. But this is getting ahead of the story.

THE MONGOLOID PROJECT AS ORIGINALLY CONCEIVED

The mongoloid project at Sonoma began in 1959 as an attempt to study longitudinally the intellectual growth of a selected homogeneous group of retarded children.[1] It later became possible to compare such retardates reared in an institutional situation with those of similar age and etiology reared at home (Dameron, 1963; Stedman and Eichorn, 1964; Bayley, Rhodes, Gooch, and Marcus, 1969). Although other types of mentally retarded are often difficult to identify in early infancy, the disorder known as Down's Syndrome (mongolism) appeared to offer an opportunity to identify children with this clear-cut physiological disorder at birth and to follow them from very early infancy.

The subjects in this longitudinal study were ten infants diagnosed AAMD Class VI (mongolism). At the time of admission to the Special Projects' unit of Sonoma State Hospital their ages ranged from one month to four and a half months.

Although the longitudinal study had not originally been planned to include "enrichment" procedures, the institutional setting initially did represent a somewhat more stimulating environment than is typical in institutions for the mentally retarded: children lived in the research wing, with two infants sharing a room. During infancy, the children were held individually for feeding. Later they were fed at small tables in groups of four to six. When they reached walking age, their housing was reorganized to consist of a dormitory room, a dining room, and a large playroom (which is essentially the present physical setting). During the children's waking hours the adult-child ratio has been at least 1:5, a ratio which represents about half the number of children per adult found on the regular wards of the hospital.[1] While small toys were not available before the present program was instituted, the children did have limited access to large toys such as wagons and tricycles.

---

[1] Selection was based on a confirmed diagnosis of mongolism and freedom from other severe problems (Stedman and Eichorn, 1964, p. 393).

The revised Bayley Scales of Infant Development, Mental and Psychomotor sections, (Bayley, 1969) were administered to the Special Projects' mongoloid children at monthly intervals until they were about 22 months old, and at three-month intervals thereafter. The Stanford-Binet (L-M) was added to the test battery as the individual children became capable of passing some of its items. The first cross-sectional comparison with the ten home-reared mongoloid age-mates was made early in 1962 (Stedman and Eichorn, 1964). (The Bayley Infant Behavior Record was added to the test battery for the comparative tests.) At that time the children ranged in age from 17 to 37 months, (mean age, 28 months). In size and motor coordination, as measured by anthropometric indices and the Bayley Psychomotor Scale, the two groups were not grossly disparate, although on several anthropometric indices the home-reared children measured significantly larger.

---

[1] The Special Projects' Unit at Sonoma housed not only these mongoloid children but also six children with phenylketonuria (PKU). A charge nurse supervised the nursing functions of the ward personnel who were frequently switched from one patient group to the other. The ratio of one adult per five children was maintained.

Both sets of children[1] were tested a second time in the fall of 1964, when they were about five years of age. At that time the Special Projects' mongoloids had just begun attending the hospital nursery school. This second comparison testing indicated that, as is typical with mongoloids, their IQ scores had declined overall with time. In the first comparison two of the hospital-reared children achieved higher IQ's than did the age-matched community children. In the second comparison no hospital-reared child scored higher than his match (Bayley, et. al., 1969).[1] An item-analysis of the Bayley Mental Scale indicated that 11 of the 15 items that differentially favored the home-reared group at a statistically significant level were directly involved with language, both in its receptive and its expressive aspects (Bayley, Rhodes, Gooch, and Marcus, 1969). For instance, seven children in the home-reared group were able to use single words to make their wants known, compared to only one of the hospital-reared children. Seven of the home-reared children could name three of five test objects shown them, identify five of eight pictures, and combine two words to form a simple sentence; none of the hospital children could pass any of these items. Communication within the hospital group was limited to bodily and facial gestures (often uninterpretable), to grunts, groans, squeals, and screams. Misunderstanding often led to inequities in treatment.

---

[1] Three replacements had to be found for home-reared subjects who became unavailable for study in the interim; these replacements had to meet the criteria originally used -- i.e., freedom from other medical disabilities and comparability of birthdates. Matches for sex were made where possible, as in the original selection.

Although the children were only intermittently successful in communicating with adults, they were often able to communicate with each other nonverbally in rather complex ways, even devising games that required cooperative effort. One such game, a favorite, involved undressing each other, raising a double-locked screen, pushing open a single-locked window, and tossing the clothes out the window into the bushes for the technicians to fetch. Other games involved removing screws and bolts from the radiators, windows, and doors.

---

[1] Such findings showing the superiority in motor and verbal skills of home-reared mongoloids as compared to those in institutional settings accord with the findings of investigators such as Kugel and Reque (1961); Centerwall and Centerwall (1960); Shotwell and Shipe (1964); and Kock, et.al. (1965).

It appears that among these children language could not easily or naturally develop. They neither had "the active coaxing and coaching for performance which was observed in the home and verbalized by the mothers, nor did they have the stimulation of normal siblings and peers" (Stedman and Eichorn, 1964). Their daily regimen (except for the smaller child/adult ratio) was similar to the standard routine on the hospital's pediatric wards. The children generally awoke at 5:30 a.m. Apart from the time spent at meals and toileting, and a two-hour afternoon nap, the children spent much of their time in their underpants or diapers and undershirts on the floor of the large empty dayhall. The television set was turned on most of the time, but there was a minimum of verbal communication directed at them by the caretaking adults. They were feeding themselves at this point -- sloppily, using spoons and wearing huge bibs that were tucked under their chins and were held down by the trays to catch spills. None of the children at this five-year-old period was toilet trained; the technicians simply spent a good part of the day toileting them.

In the dayhall, where they walked or crawled, their most frequently observed behaviors were hitting each other, undressing each other, and running from the technicians. On the other hand, they often sought the attention and affection of entering adults, scaling visitors like trees, grabbing and clinging -- sometimes all ten at once. Feces-smearing occurred often enough to be a problem, and only the sturdiest toys withstood their attacks. One child was a regurgitator, another had a fear of adults touching him in any context which differed from that required for routine care.

Although, as mentioned earlier, the Special Projects' ward offered these children more inviting quarters and more staff caretakers than is typical in a hospital for the retarded, it nevertheless gave the children very little in the way of meaningful stimulation or systematic social rewards. The destructiveness and other pathological symptoms observed in some of the children (regurgitation, fear of being touched by adults) appeared to be sequelae of their inability to make sense of their world. With very little that was meaningful in their environment, these children were evidently deteriorating, becoming increasingly retarded even beyond the usual expectation among mongoloid children.

Yet one rather curious finding that emerged from the second comparative study suggested that the prospect for mongoloid children need not inevitably be so grim. In testing the home-reared children, it was noted that two of them appeared to be understanding more, speaking more, and articulating more clearly than the others, even though their mental test scores at that time fell near the group mean. Both these children, it turned out, were attending a special nursery school, Walpert Center for the Retarded, in Hayward, California; both were in the same class.[1] Several members of the Sonoma Special Projects' staff visited this class and were surprised and intrigued by it. The group consisted of severely retarded children about the ages of the Special Projects' mongoloids. But these children were busily engaged in a whole gamut of activities: saluting the flag, sharing books with each other and the teacher, commenting on pictures in these books, engaging in rhythm exercises, songs, and musical games, following instructions to share or to remain seated, indicating their need to go to the bathroom and caring for themselves in the bathroom. This scene contrasted sharply with the kind of behavior observed daily in the Sonoma setting.

There were further accomplishments at the Hayward Center: at various points individual children were summoned from the class for a half-hour private session with a language specialist. In mock telephone conversations (using a teletrainer) the child and the language specialist greeted each other by name, discussed what Mommy and Daddy were doing, talked about who was and who was not at school that day. When a child said "bie" instead of "pie," the specialist gently reminded him, with a demonstration before the mirror, that he had forgotten "the popping sound." In response to picture cards children were encouraged not only to make correct identifications but to answer in full sentences.

---

[1] The classroom was composed of preschool retardates; Mrs. Judith Boynton was the teacher.

The key to this school's success appeared to lie in the coordination of the efforts of the classroom teacher, the language specialist, and the parents, with the predominating theme in all activities being the development of language in these children. Under intelligent and patient guidance these severely retarded children had come a long way in learning to understand, communicate, and socialize.

The question was: could such techniques be modified for subjects like the Special Projects' mongoloids, operating at a comparatively lower intellectual level and knowing only the more limited institutional milieu? It was true that the hospital children had been selected initially according to the same criteria as the home-reared children; their initial learning capacity should theoretically have been similar. Yet in two comparative studies their measured intelligence was significantly lower than that of their home-reared peers, and the discrepancy was increasing as time passed. Whether this downward trend could be halted appeared to be a compelling subject for research; from humanitarian, as well as theoretical, viewpoints it was felt that the attempt must be made.

Accordingly a proposal was made and approved by the State Department of Mental Hygiene through Dr. Robert T. Ross, then Acting Chief of Research. The language specialist at the Walpert Center for the Retarded was called in as a consultant. Subsequently a program of day-long language training was drawn up. The program was introduced during the summer of 1965, the instruction of research staff and psychiatric technicians taking the form of on-the-job training. An abbreviated description of the program, its modifications, and the results it has produced follows. Detailed procedures, methods, and materials are in preparation in the form of a manual for use by teachers and ward personnel, and a film describing the program and demonstrating some of these procedures has been produced and is available.

ASSUMPTIONS UNDERLYING THE LANGUAGE STIMULATION PROGRAM

Since verbal behavior was one of the key areas of deficit about which something could be done for the institutionalized child,[1] the training program was designed to focus on building the receptive and expressive language skills of the Special Projects' mongoloids. A day and evening-long intensive stimulation program was planned in which all blocks of time not devoted to feeding, toileting, and other routine tasks would be used for regularly scheduled supervised activities designed primarily to increase each child's exposure to meaningful verbalizations and to provide reinforcement (praise) for appropriate responses to such verbalizations. In this way it was hoped that the groundwork would be laid for the development of speech (expressive language). Rather than postpone language training until the children were better socialized, language training itself was believed to foster socialization as well as further intellectual growth. For this reason, all _special_ emphasis on toilet training and other related self-help skills was discontinued. (As mentioned earlier, in the past large blocks of time had been devoted to toilet training -- toilet training in the sense of "catching" children by taking them to the toilet frequently and for lengthy periods of time). The ordinary daily occurrences of life (toileting, dressing, etc.) were exploited to their fullest in terms of providing situations where meaningful language could be used and thus taught, but no more time was devoted to their execution than was normal or necessary. The children were always strongly encouraged to do things for themselves and were shown how to do something with which they were having difficulty, but this training was carried out in short, specific periods of time. The major target, then, was to increase the amount of verbal communication directed at the child and understood by him (receptive language) as well as to increase the amount of verbal communication required of him (expressive language). The later and secondary target was, through articulation training, to increase the likelihood of others being able to understand his efforts at verbal communications.

---

[1] A crucial area about which very _little_ could be done, was that of mothering. The proposal did include recommendations for constant caretaker attendance or attention, but this of course does not substitute for parental care.

Language was the keystone. A day and evening-long intensive program was devised to set this keystone in place. The entire ward program was based on the assumption that the retarded child, in any given situation, assimilates at a slower rate than would a normal child of comparable mental age. The program was open to the comment that it offered too much stimulation (in the sense of too many hours in a classroom), that there was great danger of overtaxing limited attention spans, that even normal children of equivalent MA would grow restive under such a program, and that there was too little time for "free-play." The literature offered little in the way of guidance. Tizard (1960), in comparing gains of institutionalized mongoloids who were given a play type of nursery school program with those who had no such program, had warned that attempts to train mongoloid children in school-like situations were ultimately nonproductive. Yet to the Special Projects' staff at Sonoma, dramatic first-hand evidence from the Hayward school showed what could be done in an intensive systematic program whose primary focus was language development.

Furthermore, the proposed program represented a departure from tradition not only in amount of stimulation but also in degree of structure. The staff observed approaches that stress independent exploratory activity for the severely retarded child. Often in such settings, the children appeared to move aimlessly from object to object exploring randomly or destructively. In the words of one specialist in early education for the mentally retarded,

> If we are to profit from past experience, our conceptualization of a program of training for pre-school age retardates needs to have far more

> structure than the usual fun-and-games nursery school program.... The evidence in earlier studies shows that there is little to be gained from a random, laissez faire approach. Strewing toys, games, and other artifacts around the class room is no guarantee of meaningful activity and consequences of learning on the part of the children. While it is probably appropriate to let the children set the scene for activity under certain conditions, it is probably more appropriate to first build into the children the skills and knowledge that will make independent experience profitable and measureable.
>
> (Goldstein, 1964, p.7)

In general, the normal pre-school child from a moderately stimulating environment has already learned to manipulate his environment in such a way as to derive meaningful information from it. Such manipulatory behaviors (verbal and motor) are seen infrequently or not at all in the severely retarded child; the skills must be specifically taught. If he is to learn from his experiences he needs not only more frequent but also more rationally structured stimulation and reinforcement.

In addition to these positive assumptions about the nature of a program designed to stimulate language in mongoloid children, a negative assumption also underlay the proposal. This was the refusal to subscribe to the fairly common view that children falling in the 20-50 IQ range typical of mongoloids are at best only "trainable," not "educable." Because they are assumed to be incapable of learning academic skills or because many feel that the teaching of academic skills involves too great an expenditure of effort and time in a limited school day, the practical consequence is that these children's curriculum is very frequently limited to self-help skills and other non-academically oriented activities. While the program did not start with any positive expectation about how far one could go in teaching language skills to these children, neither were any theoretical ceilings set. What has characterized the program from the start is an openness to the unanticipated potentialities these children might realize.

Some additional methodological assumptions about the most effective ways of teaching mongoloid children to understand and communicate were made. It was stressed that the primary attention of the technicians should be focused on language, with articulation being of secondary importance. It was the contention of the staff that it was non-functional to teach a child to articulate the word cat perfectly if he did not know that a cat is a soft, furry, four-legged animal that says "meow" -- that is, if he had no appropriate referent for the phonemes he was articulating.

In a kind of "supersaturation" technique often used with deaf children, the staff attempted to give the children as much stimulation as possible in all sensory modalities -- visual, auditory, tactile, kinesthetic, and so on, talking to them constantly in meaningful language. It had been noted in the Hayward preschool that initially most mothers were nonverbal at home because their child was nonverbal. The parents were asked to talk to the children at home all the time, about everything, even if the child did not answer, describing what they were seeing and doing, what they planned to do. They were urged not simply to label things but to describe them for the child and ask questions about them. The parents were admonished "Don't just say 'bird.' Say 'Look at the bird.' 'It is a pretty bird.' 'It has red feathers.' 'The bird can sing.' 'Do you see the bird?' "

Coupled with the need for this barrage of language directed at the child was a related demand for verbal expression by the child. It had been noted that home-reared children who did have some receptive language were often allowed to "get by" simply by gesturing. No one expected them to talk. It was found that expecting a child to talk, insisting that he deliver the very best performance he was capable of and then reinforcing this performance by a word of praise produced gratifying results.

The unflagging attention in gentle firmness required in this kind of program was beyond the scope of a single language specialist seeing the child for half an hour once every week. Language training had to operate around the clock and permeate all aspects of the child's environment. This meant that language therapy would have to be carried out by people who had not been trained as therapists -- that is, by parents and teachers, and in the case of Sonoma, by hospital aides (or psychiatric technicians as they are designated here). To translate these methods so that they would be usable by paraprofessionals under supervision was one of the primary tasks of this program.

This required more than the teaching of methods. It required also the teaching of attitudes -- a new way of looking at the mongoloid child and a new way of structuring his environment.

MAKING THE ENVIRONMENT MORE STIMULATING: GUIDELINES FOR MANAGEMENT

The guidelines for ward personnel were drawn up by the language specialist. Basically, as these guidelines were explained to the staff, the following behaviors were emphasized: 1) talking to the children continually and simply about what is going on, what they and others are doing and requiring that they listen; 2) requiring that children use some form of verbal behavior to get what they need (a gesture is unacceptable if the child can make even a rough approximation -- e.g. "wa" for "water"); 3) expecting and demanding slightly more of the child than he appears to be able to give; 4) administering discipline promptly and decisively for destructive or disruptive behavior; and 5) reinforcing the desired behaviors with approval. Clinging was to be discouraged in favor of more acceptable forms of affection, such as brief hugs. These recommendations were designed to decrease the time spent in random or destructive behavior and increase correspondingly the time available for appropriate language-oriented behavior.

The daily regimen was drastically changed. Up to this time, as noted, the children awoke at 5:30 a.m. and had a two-hour afternoon nap. Aside from two hours a day in the hospital nursery school and the time spent in dressing, bathing, etc., the children spent most of their time in random activity in the dayhall. They went to bed (they were still sleeping in cribs) at 7:00 or 7:30 at night.

Now this was all revised in a new schedule. First, the children were moved from cribs to beds. Each child was given a bedside stand in which to keep the small toys he had chosen on an expedition to the ten-cent store. Then more hours for instruction were created. Instead of being put to bed at the earliest possible hour, the children were to be brought to the classroom set up on the ward, unless they showed extreme fatigue. The afternoon nap was eliminated and children were allowed to sleep slightly later in the morning. The net result was a gain of at least three waking hours per day.

During these hours -- or at least during those not devoted to meals and personal care -- the children were to be worked with in groups in the ward classroom and individually in a small isolated room on the ward. A list of activities suitable for the individual and group work, in the ward, the outside play area, and the dayhall was drawn up. The procedures and materials were explained to the technicians, whose job would henceforth be to instruct the children while they were on the ward.

The children now spent much less time in the dayhall, and they were never to be left there unattended. They were to be playing group games, singing, listening to stories, and so on.

The television set was to be turned off at all times except when a children's program was being shown and a technician was sitting with the children, talking to them about the program.

THE INITIAL LANGUAGE STIMULATION AND ARTICULATION TRAINING

The initial technician training program consisted of eight to ten group sessions (which included discussion periods and practical demonstration) over a total of about eight to ten hours. At these sessions the general philosophy of the language stimulation program was made explicit, the guidelines were clarified, and the schedule was thoroughly discussed, along with the suggested activities. It was stressed that even though the child did not use expressive language, it was of primary importance to keep talking to him and to reinforce by praise and excitement his demonstrated knowledge of receptive language (as when he successfully followed directions). If and when the child did attempt expressive language, the child was to be generously rewarded with praise for these efforts also. It was emphasized that the acquisition of receptive and expressive language was the primary goal, and that articulation correction was to be of very minor importance at this point. That is, the children had to show that they had the conceptual pegs on which to hang the appropriate sounds before articulation correction could even be considered.

When the program, began the ten children were essentially nonverbal; the child who was most advanced had a total expressive vocabulary of ten to twelve words which was used only with a great deal of coaxing. After the language development program had been in effect for four months, it became clear that all but one child[1] had developed some meaningful expressive language. These nine children were given a simple articulation test. At first pictures were used to elicit the desired verbal response, but this proved unworkable due to the limitations of the children's speaking vocabularies. Therefore, the children simply repeated after the examiner all phonemes (sounds) in isolation and words that included the phoneme in the initial, medial, and final positions (e.g., to test the phoneme p, the child repeated the words pear, happy, rope). Due to the general severity of the children's articulatory problems it seemed nonfunctional to test for blends (e.g., kl, gl, tr, gr) at that time.

In the articulation training proper a mimeographed summary for correcting articulation was distributed and explained. The major types of articulation disorders were pointed out, and examples were given of each (substitution -- saying "wed" for red; omission -- saying "top" for stop; addition -- inserting an extra sound; distortion -- using a sound that does not occur in our language but that is used consistently in place of the correct sound). The training demonstrated the three positions in the word in which defective phonemes can occur: initial, medial, and/or final, as well as the major steps involved in the correction of a defective speech sound.

---

[1] This is Donald, who is still essentially mute, and whose IQ consistently measures around 14.

CORRECTING ARTICULATION

In addition, the notation system which was used on the articulation tests for recording the major speech errors was outlined using "dist." as an abbreviation of distortion, writing out in the conventional alphabet rather than in the phonetic symbols, the substitutions, distortions and omissions.[1]

This attempt to keep the instructions non-technical was simplified by having the technicians learn the "naming" system used by many speech therapists to help children describe and produce sounds. Each consonant sound has a name; viz., "p" -- the popping sound, "b" -- the bubble sound, "h" -- the ha ha sound and so on. Some of the descriptive names used at Sonoma are fairly standard (e.g., "s" the Sammy Snake sound) while others have been changed to accord better with the experience of institutionalized retarded children. In general, an attempt was made to have the sound name reproduce the sound itself; e.g., "t" was referred to as the "tick-tock" rather than the "watch" sound.

---

[1] In general, during the explanation of articulation procedures, the simplest non-technical language was used. The phoneme "p" was referred to as "puh" rather than as a "bi-labial plosive" in an attempt to avoid overburdening technicians with unnecessary technical vocabulary.

Technicians were shown how these sound names could be brought in incidentally while other language learning was going on. Thus, for example, when a technician was showing the children a model of a pig from a box of objects, she could not only describe the pig ("Look at this. This is a pig. He has a curly tail..." etc.) but she could also say: "Do you hear the popping sound in this word? P-p-pig. Can you making a popping sound? P-p-p?"

Technicians were also shown how the children could be encouraged to "feel" the sounds on the speaker's throat, nose, or front of the mouth (depending on whether the sound was voiced, nasal, or voiceless). This technique of feeling and reproducing sounds (the multi-sensory approach) appears to work more successfully with retarded children than does simply presenting a sound through auditory means. The procedure is cast in terms the children understand -- e.g., "turn your motor on" for voiced sounds; "turn your motor off" for voiceless sounds.

After these fundamentals of articulation had been explained and discussed with the technicians, the children were brought in one at a time and the principles were demonstrated directly with them as the technicians watched. The techniques to use at this stage of articulation development were illustrated for the technicians with each individual child. To extend this individual work a notebook was made up for each child, including the results of his articulation tests, and a "speech meter" for each sound upon which to record the child's progress. A primary teaching aid in articulation work was a notebook with a section for every speech sound, each section containing pictures which represented the particular sound in all three positions -- initial, medial, and final. For example, the section for the phoneme "p" contained pictures of a pig, a pipe, a pear, a pencil, a coffeepot, a teepee, an opossum a poppy, soup, a cup, a rope, and a bar of soap. Fronting each section was a sheet listing as many words as could be found with the speech sound in each of the three positions. This listing afforded an opportunity to practice the sound in common words which could not be adequately represented by a picture or for which a picture could not be found. Other articulation activities included the use of Play and Say[1] cards, use of the tape recorder and Teletrainer,[2] and other such aids.

A general guideline that has applied to the articulation work, indeed, to the language training as a whole, is the need for an attitude of gentle but firm control on the part of the adult. The adult is advised to hold the materials, whatever they are -- book, cards, pictures. The child may touch and point, but the adult is in control. In line with the principles described earlier, the adult is calm and firm about demanding the most the child can give. The idea is to strike the balance between the excessive frustration that leads to anxiety and the insufficient challenge that leads to boredom -- no easy task. In general, training sessions end on a positive note by having the child do something he knows and enjoys.

---

[1] Workomski, Robert C. and Irwin, Ruth B. "Play and Say," Stanwix House Incorporated, Pittsburgh, Pennsylvania.

[2] Teletrainer, Pacific Telephone and Telegraph Co.

CONTINUITIES AND MODIFICATIONS IN THE PROGRAM

The overall schedule of rising and waking times and the emphasis on individual and group work has been maintained during the two and one-half years of the program covered by this report. Each child was seen an average of three times a week in a half-hour session of individual work with a technician. Together they worked in an individual room equipped with a small table, two small chairs, and a storage chest. While this individual activity was going on, the other technician was working with the other children[1] in the ward classroom. This room contained four small tables arranged to form a U, and a semi-circle of child-sized chairs. The walls were covered with pictures and cutouts as well as shelves, cabinets, and storage chests. A low blackboard, flannel board, and bulletin board were installed on one wall. The room resembled a nursery school classroom, and it was here that the children spent most of their time on the ward in supervised and strictly scheduled learning activities. Activities (which were group activities for the most part) were changed every 15 to 20 minutes. Typically, the children were encouraged to stay with a task until it was finished, shown how to do it if they were obviously at a loss, but urged to do it themselves when possible. The technicians talked to the children about the object or activity at hand and highly praised the children's own attempts at speech.

---

[1] There are eleven mongoloid children who are housed on the Special Projects' ward, though only ten of them are members of the original research group. This eleventh child, a girl, was brought onto the ward on an experimental basis when she was 2½ years of age and she has remained there since. None of her test scores appear in any of the research data reported, however, as she has not participated in the program from the start nor was she chosen in infancy according to the stated selection criteria.

For the first year and a half of the program, during the individual work periods, the children were encouraged to look at picture books, name objects and pictures, play with puzzles, read from flashcards, and practice articulation with the use of mirrors and tape recorders.

More needs to be said about the value of individual work per se. The situation as it exists on most hospital wards, in which adults supervise the actions of large groups of children, is not conducive to intimate knowledge and understanding of the individuals who comprise that group. Rather, the adult knows the child only as he behaves within the structure of the group and as he reacts to the pressures for uniformity of behavior which exist as a result of the very fact of this group situation. Removing the adult and each child from this context and placing them in a relaxed but structured instructional situation which is both physically and psychologically removed from the group affects the adult-child relationship in a variety of ways. The technician is given an opportunity (and is almost forced) to become personally involved in learning to know the child as an individual and how he behaves when he is removed from the constraints of the group. The participation by the technician in such an instructional situation which is both structured and tailored to the child's present learning needs, should bring about positive changes in each child's behavior, thus providing the technician with a meaningful and personal reward for his labors.

From the point of view of the child, individual work provides a situation in which he is responded to on the basis of his own actions, rather than in the stereotyped, often impersonal manner which occurs when he is present only as a member of the group. He is thus provided with an opportunity to develop a fuller concept of himself as an individual and to benefit from instruction which is appropriate to his learning needs.

Activities in the ward classroom included puzzles and individual toys, and "Come and Find" games on the flannel board (child was required to identify by naming and/or pointing to the name, mumber, or color of various flannel cutouts). The bulletin board displayed pictures of staff members and children, as well as pictures of food, animals, and colors, as stimuli for conversation. A "What Box" stocked with a variety of objects offered further stimuli for talking and understanding.

Records, rhythm instruments, finger plays, and songs were used, as well as art materials, such as crayons and Play-Doh. Cooking experiences allowed children to learn new vocabulary while helping in the preparation of simple foods (toast, waffles, popcorn, pudding). A pet dog and a pet parakeet also offered opportunities for language stimulation. If the children became restless, they could be taken to the larger, more sparsely furnished dayhall for large motor activity and games such as Ring Around the Rosy. In addition, as time passed, in both the ward classroom and in individual work, increasing amounts of effort were devoted to the teaching of reading. From the very beginning of the enrichment program, flash cards upon which were printed the children's first names had been coupled with photographs of the children. The pictures and flash cards were used both in individual work and in the ward classroom. It became increasingly clear that the children were reading these flash cards in the absence of pictures. Subsequently, the objects in their environment were labeled (chair, door, window, table, etc.). Words such as arm, brush, leg, nose, printed on flash cards or on the chalkboard were also used in the ward classroom, and it was noted that many of the children responded by correctly identifying those parts of the body or objects upon the presentation of the flash card. Many of the activities (such as group games, fingerplays, cutting and pasting, etc.) are common to nursery school programs everywhere. But specific to this program is the stress which was and is placed on exploiting each given activity, whatever it might be, in terms of its potential as a language stimulator. The mastery of the specific activity (though it was seen as being important) was not viewed as the primary goal in itself; rather it was seen as a vehicle through which language (both receptive and expressive) could be taught.

As the children showed more ability to respond to increasingly complex academic tasks, certain changes were introduced in the scheduling and nature of activities. The children had formerly spent large blocks of time in vigorous activity in the dayhall. Subsequently, the amount of time spent in this kind of activity was reduced, and such activity was instead interspersed occasionally in the more concentrated work in the ward classroom. The entire pace of the language-related activities was stepped up, in accordance with the children's ability and eagerness to do such work. As their comprehension increased, activities requiring more complex operations were introduced. These are reflected in the specific and generalized schedules contained in Appendix D. Although some concern was expressed about "wearing out" the children, at the end of their day around 8:30 p.m. it is usually the technicians, not their charges, who are thoroughly tired.

In the fall of 1966 the hospital school activities and the ward activities became more fully integrated. The reading segment of the program became more formalized with the introduction in January, 1967, of the reading series to be described in the following sections. During that school year, a program was planned which was structured to employ to best advantage the two technicians who were accompanying the children to school.

As part of the hospital school classroom program, in addition to the usual pre-school activities (cutting, coloring, prewriting, dance, drama, crafts) many experiences related directly to language acquisition and eventually to reading. Some examples are training in speaking and listening and building concepts of position and directionality; specifically, right-left, here-there, in-under, on. During the 1967-68 school year there was less small group work because of a reduction in the number of psychiatric technicians present. In addition to academically oriented activities, the children were taught to run errands, take messages, do daily jobs, play and work independently, and provide for the physical care of their guinea pig. As in the ward classroom, the program was supplemented by things to do and talk about -- tending plants, taking field trips, cooking, and eating.

The two programs -- ward and school -- were administratively independent; i.e., the teacher was responsible for what happened in her classroom, and the program coordinator was responsible for the program content, the training, and supervision of technicians in their function as instructors. But after the introduction of the formalized reading program, to be described below, the two met frequently to plan and to coordinate the new reading units and related materials and conceptual activities that would support them.

New reading materials were first presented in the school and then reinforced by practice and drill in individual and group sessions on the ward. On any given day, ward instruction provided three reading activities; three language activities; three articulation activities; four special activities; two number activities; two song, finger play, and group game activities; two rhythm activities; and one story-time activity. Each activity lasted approximately fifteen minutes (see Appendix D and Appendix E).

READING TRAINING: THE BACKGROUND AND CONSTRUCTION OF MATERIALS

As stated earlier, from the very beginning of the language stimulation program, the children were exposed to printed words, i.e., their own names. The names were coupled with photos of the children. These labeled photographs, as well as photographs of the staff members, were designed originally to serve as a stimulus to the children's speech. But after some months it became clear that at least a few of these children could appropriately and reliably respond to the written symbol alone without pictorial clues. So other written words were introduced: the names of common objects, parts of the body, and so on.

It should be emphasized that teaching these children to read in any systematic or extended fashion was not an initial goal of the Program at Sonoma. There was the example of the Walpert Center for the Retarded in Hayward where home-reared mongoloid children had been observed to read printed words as part of their articulation and language training. But the staff had no expectations that an extensive reading program would be feasible for this group of institution-reared mongoloid children. (Neither would this have been regarded as an impossibility. The question simply did not arise.) It was the children themselves who determined the course of their future training, as printed words began to have meaning and excitement for them; it seemed to come as the next logical extension of language training.

A pilot reading series was used with the children during the four-month period from September 1966 through December 1966. This pilot work indicated that at least some of the children could begin to cope with this kind of presentation which dealt not simply with single words but which combined these words into sentences. However, it was found that the pilot units increased in difficulty too rapidly. It was decided that a series of simple readers should be developed for use with this special group of children, according to the following principles:

1) The reading material should be incremental, built-in easy, gradual steps from individual words to short phrases; from short phrases to sentences; from sentences to short stories. This prerequisite was not unique to the Sonoma Project, since most pre-primers are based on some principle of incremental repetition.

2) More importantly, the reading material must have relevance to the children's own experience. The restriction both of the children's environment and of their capacity to benefit from this environment imposed rather severe limitations, particularly at the outset. It was felt that to be meaningful and motivating, reading must involve words and ideas that had reality for the children. Hence it must reflect their daily

experiences and their responses to each other and to the significant adults in their lives.

What was required was a series of sequential units that would hold the interest of these children because of its relevance to their own experience. Personal names seemed to represent an appropriate starting point. These, in fact, comprise the revised Unit 1, which contains a color photograph of each of the eleven children, with the appropriate first and last name appearing under each of the photographs. Unit 2 presents the names of ten objects in the common experience of the children: _table_, _chair_, _girl_, _boy_, etc., all illustrated. In Unit 3, ten color words and two articles (_a_, _the_) are introduced to permit simple descriptions and use of short phrases. In Unit 4 two other adjectives (_little_, _big_) and the conjunction _and_ are presented to allow the use of longer descriptive phrases. Unit 5 adds the words _I_, _see_, and _is_, to permit construction of short sentences. Unit 6 introduces ten action verbs (_running_, _jumping_, etc.) to make paragraph-length stories possible.

Units 7 through 10, accordingly, contain little stories of varying length, mostly of three, four, or five sentences. All of them are about the children, their activities, and the people who are important to them. They see pictures of a hat that has walked, run, and jumped, and they learn that underneath the hat is Gus, their pet guinea pig. They see pictures of themselves bouncing and catching balls, eating in the dining room, working in the classroom, playing outside, and going to sleep. In Unit 9, the only book that uses non-human characters, the interest of the children was guaranteed by virtue of their previous excitement at having visited the hospital farm.

The basic texts of the first six units were drafted in November, 1966; they were modified, expanded, and introduced on the ward and in the children's class in the hospital school in January, 1967. In addition to refining the sequence, this revised set employed a technical feature that has proved very useful: the masking of pictures by a half-sheet of paper or tag-board so that only the printed words are visible to the child at first. During the use of the pilot series, technicians covered the picture with a hand or arm to prevent children from making use of pictorial cues. When this procedure turned out to be unwieldy, an attempt to mask the pictures mechanically was devised. The masking procedure served a double purpose: it focused the child's attention on the printed word rather than on the pictorial cues, and it also provided immediate feedback and reinforcement for the child who attempted to read the material on his own.[1] A sample page of the first unit is reproduced in Appendix C.

---

[1] The children when working independently did not turn the page until they had read or attempted to read the words.

TEACHING READING: THE NEXT LOGICAL STEP

The reading program from the start was directed toward concept development. The staff was acutely aware of the danger of creating an educational anomaly -- children who can learn to parrot words and make rote responses without necessarily understanding what they are doing. But such reading without comprehension is obviously an exercise in futility. The teaching of comprehension and the use of language in its syntactic context seemed not only desirable but also accorded with the way language is learned. The research work of Lenneberg, Nichols, and Rosenberger (1964), among others, indicates that although the rate of language acquisition is slower in mongoloids than in normal children, the form this language takes is not qualitatively different. In both cases, language acquisition appears to involve the learning of rules or "mental templates" rather than the mere parroting of isolated responses.

From the very outset two efforts were made: 1) to find ways to show, dramatize, or suggest the meaning of the words the children were to read (concept development); and 2) to reinforce the children's sense of the usefulness of the printed, as well as the spoken word (motivation).

New concepts were built into the units as they were written. Since the beginning of this program the staff has been extremely careful to see that the children understood each new word or idea to be learned. This was done first by choosing words from the children's environment and by building the stories around their own activities. In addition, games, exercises, and demonstrations were devised to teach the meaning and to check the children's understanding of the new concepts. Concept-building and check-out took place before the child was shown the printed words. In this way the staff tried to simulate the normal process of language development, in which a child's receptive language precedes his experience with the words in a written context.

An example may help to clarify this process of concept development: If the word fast was to appear in a new story, the children's understanding of the word was explored, and the initial teaching was based on what was discovered. The concept was dramatized in a variety of ways; for example, by walking very, very slowly, then walking very, very fast. The instructor's voice was also used appropriately. The children were then asked to do various things at various tempos: to walk to a designated spot slowly, to return fast; to clap their hands, turn a music box, stamp their feet, and so on -- all at the designated speeds. All this was done in small groups and was enacted physically in an exaggerated way, so that the children got a physical as well as mental feeling for these concepts. A similar exercise was done with push and pull (pushing and pulling a heavy sandbag in a wagon) to give the children a physical understanding of the difference between the two kinds of action.

Once it was clear that the children understood these concepts, the printed words were introduced and associated with the same activities. In most cases no more than two 15-minute blocks of time were required before a new concept was grasped by nearly all the children. Abstract concepts such as nighttime, share, sky, and friend, were of course more difficult. Most words were introduced in relative pairs. Friendship and fighting were dramatized and enacted by pantomime mock-fighting, then shaking hands and hugging coupled with appropriate verbalization. The children watched the instructor go through these behaviors with one of them (mock-fighting, smiling,shaking hands, saying "We are friends."); then they carried them out themselves, and finally they found the corresponding pictures from the flannel boards.

Words like conjunctions, articles, certain adverbs, and prepositions which could not be acted out or represented pictorially were the most difficult to teach. In these cases an attempt was made: 1) to focus the child's attention on the word, so that he at least knew of its existence; 2) to help him become aware of the use of the word in the speech of people around him, so he could get some sense of its context; and 3) to put the child into structured situations which required him to use the word properly himself.

This is how here and there were taught (where had been taught in previous activities): several objects were placed on a stool close to a small group of children, and several other objects were placed on a table across the room. The instructor spoke of the HERE group and the THERE group. "Look, the car is right HERE next to me; I can pick it up. Look, HERE it is... HERE...listen to the "ha-ha" sound. Oh, WHERE is the ball? No, not HERE. Oh, THERE it is. That's right, Tina, THERE it is, far away." Each child then came up. The instructor asked, "Where is the pencil?" The child was required to answer, "HERE it is." After each child had had an opportunity to respond, the small group was shifted to the other part of the room, and the same sequence was followed, only at this point "HERE" and "THERE" referred to different objects than they did before. Through such practice children got the idea that HERE is close and THERE is far away. The printed words were then introduced by placing a sign or a flashcard with each group of objects, the here group and the there group.

Similar techniques were devised for teaching the meaning of the words and, yes, no, and not, and for the concept of answering questions. Special activities were devised for physical enactment of off-on, over, under, in, and so on.

In all of these exercises the instructor exaggerated, dramatizing through voice and body movements what she was trying to convey, and invited as much physical and emotional involvement from the children as possible.

It was recognized that teaching these concepts was only part of the job. The children had to understand and feel not only that printed words had meaning, but also that these printed symbols could be useful to them. For the first two to three weeks of the reading program, the children did not seem motivated (once they had learned their own first and last names) to invest their attention and energy into learning their first set of words. First the teacher had to convince them that words could indeed be of use to them, that there was good reason to learn them.

The following activity was constructed so that the children could experience what words could do for them. A set of four small red boxes was used. One new word was fastened on each box, and under each was placed a miniature object illustrating that word. The children were already highly interested in the objects. The boxes were shifted around, and then a child was asked to find one object, let us say a toy chair. At first he was allowed to look under any box he chose, whether or not it was the correct one. This procedure proved to be unfruitful, because the child was reinforced by being allowed to see an object regardless of the correctness of his response. So the teacher began holding down the boxes until the child pointed to the right word. After each incorrect response, the boxes were shifted all over again. When he chose the right word he was allowed to look under the box and take out the object. The game was highly motivating. After four days, the red boxes were no longer necessary and have not been used since.[1]

Also important in building motivation were bulletin board cards. As each new word was introduced, a card with the printed word, hinged to a picture card underneath, was mounted on the bulletin board. The child could not look under the word to see the picture until he read the word. Children worked with these words both individually on their own and as part of group activities. This principle of using the picture as the feedback and reinforcer parallels the use of the masking device in the readers themselves.

In addition to the work on comprehension and motivation mentioned earlier, the hospital schoolroom was a setting for exploring phonics in a new way. The names of the sounds

---

[1] This was true for all the children except Walter, who had particular difficulty in learning the words. Several months later, the red boxes were again used with this child but with an additional motivational technique: a minuscule food reward was placed under one of the boxes (a small piece of cookie, a small piece of potato chip). When Walter found the right box, he got his reward. After about four weeks of individual attention, Walter was over the initial hump; his learning has progressed although he is still behind the other children. The activity itself was very exciting to Walter. Soon, through building up interest and status in words, Walter was working without the necessity for primary reinforcement.

(e.g., "Sammy Snake sound") instead of the alphabetical name is standard in speech therapy but fairly new in connection with a phonic method of teaching reading. Because the children had been using this terminology for early speech and language development work on the ward with daily lessons and drill in the classroom, the language articulation work fed very naturally into the reading program. The children were able to use their knowledge of sounds to match words, to distinguish them from each other, and to remember them. Other phonics-related work included sorting pictures by beginning or ending sounds, telling if a particular word has "the bubble sound" in it or the "popping sound," and so on. The entire first year of the schoolroom program was spent going slowly and carefully through the sounds, so that the children felt secure and comfortable with them and so that recognition of the sound and its name was second nature to them. The intriguing names for the sounds (again vividly acted out by the instructor) served as an interest arouser and mnemonic aid. In this way the children thoroughly learned the consonant sounds, recognizing them in their phonics work and in their reading. They have not yet worked with the vowel sounds nor with the more complex blends, yet some of the children can now fully "sound out" simple words. These intensive auditory discrimination activities in effect since the beginning of the program appear to have provided a firm basis for such word-attack skills.

GROUP AND INDIVIDUAL INSTRUCTION ON THE WARD

A sample of the ward classroom activities is given in Appendix D. Those of particular relevance here, of course, are the reading activities proper and the underlying language activities, as well as the overall verbal interaction between technicians and children. Special Activities refer to the ward classroom activities devoted to the teaching of concepts (mostly from the current reading unit) which needed the kind of drill that could easily be carried on by the technicians on the ward. So, for instance, when Unit 10 in the reading series was introduced, the words day and night (concepts which would probably require a good deal of practice in terms of meaning before the children could readily grasp them) were fastened to the magnetic board. Children were shown, then asked, which pictures (sun, moon, stars, children playing outdoors, etc.) went with daytime and which with nighttime.

Each child received individual language instruction from a technician for a half hour at a time on the average of three times a week. The work done in individual sessions was carefully described for each child. Approximately ten minutes of this time was given over to articulation activities and the other twenty minutes to reading, using the reading books for ten minutes and the work-sheets for ten minutes, as described below.

A. Reading Books

On any given page of the reading books the child was required to make the very best effort he could at reading the words before the masking sheet was lifted, and he got the reinforcement of seeing the picture. Some attempt was made to have children use word-attack skills in their reading when this was appropriate in identifying unknown words; e.g., the technician might ask the child to identify the "s" (Sammy Snake) and "n" (no-no) sounds in the word sun, and then have him put them together.

A child was considered to have completed a reading unit when he could read it completely on his own, correcting his own mistakes, with near errorless performance. If he made many more than two or three mistakes, even though self-corrected, he was not passed on that unit and thus could not go on to the next one. Units 1 through 6 required passing the complete unit; units 7 through 10 each had two subsections, and a child was passed separately on each of these subsections.

B. Supplementary Work-sheets (see Appendix A)

By the time Unit 10 was written, 170 work-sheets had been prepared to introduce and give children practice with the new words encountered in the reading material. Non-pictorial words such as he, the, and this were presented on a single ditto page. A child was told the words initially, and after repeated practice, was passed when he could read all the words on the left hand side and correctly match them with their counterparts on the right hand side of the page without any help the first time he saw the sheet during a given individual session.

These non-pictorial sheets, taught primarily by drill, represented a lesser proportion of the words used. In general, the attempt was made to use vocabulary which was as concrete and pictorial as possible. An effort was also made to use words which were specific to the children's vocabulary; e.g., when it was noticed that when a technician dropped a tray, spilled something, or otherwise made a slip, the children would almost invariably say "Oh, oh .... Mary made a boo-boo!" hence the slang term "boo-boo" was incorporated into the reading. For words of this representational kind where pictures could be used to depict the meaning of the word a series of three ditto sheets was used to relate the word with a picture of the object or action to which the word referred. Thus, for example, one three-sheet series (Appendix A) depicted the new words sun, moon, and stars in exercises requiring increasingly greater mastery on the part of the child.

So the technician would introduce the word sun by pointing to the picture and saying. "What is that?" "Yes, that is the sun" (or "That is the sun."). Pointing to the word under the picture she would say, "See that word? That says sun." She would follow the same procedure with the picture and word for moon and stars. She would then go down the left hand side of the page having the child match word with word and picture on the right. Then she would get the child to draw the line from the word to the word and its pictured representation, giving the child as little help as possible. In the time remaining during that ten minute segment of the individual work session used for worksheet instruction, she would repeat the procedure more rapidly. The same general procedure (relating of word to picture and word to word) was followed with the two remaining sheets in that three-sheet series when the child was ready to work on them.

On each sheet the child's name and the date was noted as well as the trial number of that sheet for that session and whether or not he was able to do the sheet on his own. The criterion for having passed was that the child complete the sheet on his own the first time he saw it during a particular session. The demands presented by the sheets themselves became more rigorous in each succeeding step of the series. Thus, on the first sheets in any series maximum cues were presented. The pictures had the word written beneath them, and the child needed only to match the printed words. On the second sheet maximum cues were still offered, but they were moved to the top of the sheet. The child was expected to work on the bottom three-quarters of the sheet, using the top as a guide only if he needed to. On the third sheet in any such series the child was required to match the printed word with the picture without any cues of juxtaposition; it was assumed when he could do this that he was reading the word.

The completed work-sheets were sent daily to the hospital school classroom for the teacher's records. The teacher was kept informed in this way of each child's daily progress and of what problems, if any, he was having.

It must be remembered that the work-sheets served as only one more aid in learning the words. As soon as the concepts and corresponding printed words contained in a new reading unit were introduced in the school classroom, work on these words began in the ward classroom and the new work-sheets and reading book were introduced to individual work.

The format of the work-sheets in terms of a three-sheet series had been originally designed for independent work by older children in the school. It was decided to use the same three-sheet structure with the hope and expectation that in time these children would be able to use them independently with the involvement of the adult being limited to checking of work done by the child on his own.

COMPREHENSION AND ITS ASSESSMENT

Although no appropriate standardized measures were available for use, there were a number of indices, formal and informal, which indicated the degree of comprehension with which the children were reading. It was difficult to check comprehension verbally with the children because their expressive language, i.e., their ability to say what they saw, heard, and understood, was still limited. Among the comprehension measures used were the following:

1. Spot checking of the children carried on while the picture was masked and at the end of a unit. Suppose Tina were to read: "The children ride the bus." She was given credit for understanding the question "Who rides the bus?" if she answered "The children," and if when asked "Do they ride a car?" she answered "No, the bus." This kind of questioning was done informally by the technicians all the time they were working with the children. It was clear that all the children who were reading the units could answer these kinds of questions. (The children had been taught how to answer questions, had been taught to say "No" to silly questions such as "Is Freddy a dog?" Exaggerated responses were taught -- "No, no. Freddy is not a dog. Freddy is a boy.") Much practicing had to take place

before the children were able to answer questions like this reliably and to sense "wrong" statements. This comprehension of questions was essential in order to be able to check, verbally, the children's understanding of what they had read.

2. Rearrangement of words in a unit. Such rearrangement did not confuse the children. They could read the words when they were rephrased as questions. In both the school classroom and the ward classroom much work was done on the chart stand upon which the teacher or technician informally writes new sentences, little paragraphs, and stories using the words contained in the reading books, in completely new ways and forms. The children read and understood well.

3. Spontaneous speech and gestures by the children as they were reading. For example, Alvan, when reading "It is daytime. The sun is up in the sky," jumped up, ran to the window and pointed upward, saying, "Sun in sky." Ginger, when reading for a group of visitors a page in Unit 8A which says, "Dr. McKean is walking to see Ginger," immediately turned around, pointed to Dr. McKean and said, "There, Dr. McKean." Such instances could be multiplied indefinitely.

4. Children's subsequent actions based on the discrimination of written words. The technicians, for example, in connection with Unit 9, were directed to print on the chalkboard sentences such as: "Give me the horse" (or cat, dog, boy, girl). The child was required to read the sentence and carry

out the request, choosing from a variety of objects. Or the technician might write "Put the dog (or girl, boy, cat, etc.) in the barn" thus requiring that the child insert the object in the appropriate place on a large specially constructed cardboard farm scene. The children did this work with little difficulty. Much stress was placed on following instructions directly after having read them silently.

5. Comprehension sheets made up for some of the stories. These sheets were constructed using words that were within the children's vocabulary, requiring them to respond by circling either the correct picture or the correct word. More exploration will be done using this kind of method.

RESULTS

As of February, 1968, five of the nine children who were reading had progressed through all the units that had been constructed and were awaiting the preparation of new materials. A record of time spent in individual work and progress through work-sheets and reading units by the nine readers is given in Table 1 in the Appendix.

The improvement in the children's articulation (correct emunciation of speech sounds) between November, 1965, and July, 1967, can be seen in Table 2. Of the nine subjects who had speech and who were therefore receiving direct training in articulation, all but one showed significant improvement. When the articulation errors committed on the two test occasions are classified according to the type of error which occurred, one sees a general decrease in the number of times an incorrect sound is substituted for the correct sound (substitutions) and in the number of instances where a speech sound is omitted (omissions). The number of distortions (usage of a sound which does not occur in the English language) shows a slight increase. This latter finding may be due in part to the fact that in some cases children who formerly omitted a sound were later attempting to produce it before it had been practiced sufficiently to be accurate. In any case, performance improved at high levels of significance (p = .001) for eight children. In the ninth, Wendy, improvement occurred but was not significant (p = .10); Wendy has a severe heart defect which requires that she spend a good deal of time in bed, and hence she has received much less training than the other children.

An approximate index of the children's progress in the expressive use of language is the percentage of spontaneous word combinations children produced during the developmental testing sessions (Table 3). A word combination was defined as "joining two or more words." "Total words" referred to the number of different words used, i.e., repetitions were not counted. These figures, gathered over a two-hour session for each child, represent a minimal estimate of expressive language ability. The range at the latest testing was from 113 to 303 total words, with a mean of 209. The group mean for total words rose most dramatically during the last testing period -- an increase of more than 100 percent between 18 and 24 months after the program was inaugurated. Percentage of spontaneous word combinations has also risen greatly during the same interval. Interestingly, one of the brightest and oldest subjects (Eddie, #10) used the fewest word combinations, which may be due to the fact that he has been able to get by with the creative use of single words and gestures. An effort is now being made to induce him to use word combinations.

The Special Projects' children's receptive language as we would expect, was much more extensive than their expressive language. One measure of receptive language is the Peabody Picture Vocabulary Test. Scores are given in Table 4 for the children at four points in time, the most recent being scores for those six children who had reached eight years of age and hence had been given the most recent battery of tests. The relative constancy of their Peabody ratio IQ's indicates that the children were continuing to hold steady in their receptive language ability.

The overall course of the children's intellectual growth may be inferred from the successive IQ measures recorded for these children. Although growth spurts in MA in individual children may occur, the usual prognosis is that the mongoloid child's IQ will decrease with increasing chronological age, as his performance drops farther and farther below that of the normal child of identical chronological age which is compared with him. In this group, on the contrary, the tendency has been to show a significant increase in intellectual ability (Table 5).[1]

---

[1] The children's psychological evaluations were usually administered by one psychologist. This procedure was deemed desirable because consistency in tester was considered to have priority over the possibility of tester bias. It was, however, necessary to test the theory of examiner bias. The services of a psychologist from the University of California at Berkeley who was not connected with the program were secured. She administered the complete battery of tests to all of the children during the spring and summer of 1966 and to six of the children in the spring of 1968. In both rounds of tests the t ratios on all measures were not significant ($t=<1.0$). While there were some differences in the scores of individual children (some increasing and some decreasing), they were no greater than the test-retest differences of the project psychologist.

This progress can be seen graphically over the several levels of IQ represented even in the rather restricted mongoloid range. Figure 1 shows the course of IQ scores for three individual children in the group. Subject A (#10 Eddie) earned the highest score before the intervention, Subject B (#3 Alvan) fell in the middle range, and Subject C (#6 Donald) was at the lowest level. The curve for Subject B is representative of most of the children, whose IQs rose moderately with schooling and markedly with language training.

What emerges from these findings is a picture of severely retarded children who, in two and a half years, changed from essentially non-verbal youngsters communicating only through bodily gestures and inarticulate sounds to children with a relatively small but very usable expressive vocabulary, the ability to comprehend a number of basic concepts, and to read and enjoy simple books.

Anecdotal evidence can give a further sense of this change and of the nature of the discriminations nine of these ten children are now capable of making:

Eddie was working on ditto sheets using the words _work_, _play_, and _school_. He drew the pencil line from work to the working scene and remarked, "Work. Boy and girl work." When he drew a line from the word "play" to the "play scene" he commented: "Play: I like that."

A technician said to Freddie and Bruce, "You look like little old ladies." Freddie corrected, "No -- man." Bruce in turn reproved Freddie with "No -- not man, boy."

Marie, a technician, was having a pre-Christmas conversation with the children. She asked Eddie what he wanted Santa Claus to bring him for Christmas. Eddie said he wanted a gun and a holster. Tina said, "How about a horsie, Eddie?"

Marie: "What do you want, Tina?"
Tina: "A candy bar."
Marie: "You know, Santa can bring you other things besides candy. What else do you want?"
Tina: "How about money?"
Marie: "And what do you want, Wendy?"
Wendy: "An animal."
Tina: "How about a pig and cow and horsie?"
Marie: "Why do you want a pig and cow and horsie?"
Tina: "For Old MacDonald, of course."

Similar anecdotes could be cited for most of the rest of the children as well.

Comparatively, the gains of the hospital children (as opposed to those of the home children) in social maturity do not appear as great as in intellectual areas of performance. This is partly the result of the assessment device used. Although they are doing better than formerly on the language-related items in the Vineland Scale of Social Maturity, they generally do not function as well as the comparison group because of a relative (sometimes total) lack of opportunity to learn various behavioral items on the Vineland Scale (setting the table, using a table knife, going about the neighborhood unattended, etc.). A number of these situations do not readily or feasibly occur in a hospital setting. While the emphasis in the program was toward greater independence for the children, there were, after all, limitations in personnel time, as well as safety factors which required that children's opportunities for exploration be curtailed in the institutional setting. As of this writing, with regard to the Vineland Scale, the children appear to be maintaining the social quotient achieved at the time of the previous comparative testing at six years of age.

Informal observation may be useful in rounding out the picture of social development. During the two and one-half year history of the program herein reported, there was a steady growth of peaceful or playful interaction among the children, with corresponding decrease in destructive, random, or stereotyped acts. While these improvements were not specifically linguistic, they appeared to result from better verbal communication. All but one[1] could be relied on to indicate toileting needs; all but one no longer wore bibs and could feed themselves with fork and spoon, having even done this creditably on field trips to restaurants. All but one could dress themselves, although there was still some confusion about inside and outside, front and back. The kind of grabbing and tugging that greeted adults entering the dayhall for the most part no longer occurred.

---

[1] The constant exception in all these instances is Donald (Subject Number 6). See explanation in footnote on page 25.

The children were still affectionate and demonstrative, but less overpoweringly so. Asocial behaviors noted earlier (such as clothes-throwing and feces-smearing) essentially disappeared. Informal comparison with mongoloid children of the same chronological age in the regular wards of the hospital was revealing: these largely untrained mongoloids were almost without exception either incontinent or simply being "caught" by technicians, eating messily, largely given to nonverbal communication, and incapable of self-help.

In the area of assuming responsibility, the Special Projects' children made great strides during the past two years. Formerly, the children often ran away in the corridors or on the grounds unless their hands were held. None was able to go to the bathroom unattended. As of this writing, the runaway problem has lessened appreciably. All but Donald can be trusted to leave the dayhall or the classroom to use the bathroom facilities and return unattended. Several children can be given a dime and allowed to walk to a candy machine around the corridor some 50 yards away and return on their own. All the children but two have had turns at pushing the food cart to or from the kitchen -- a journey of some 70 yards which requires opening and closing a gate, passing the entrance doors to the building -- completely unattended. They are delighted to run small errands for the technicians, such as fetching a forgotten sweater from the nursing station or bringing a book from the classroom to the individual work room. However, regardless of the positive changes the children have shown, it is the authors' opinion, based on informal observation, that the home-reared children are in fact superior to the hospital group in their overall social independence and competency.

Perhaps the most striking contrast to an observer is the children's evident pleasure in their newly developing identities. They appear to have come into existence for each other as individual people. Their personalities, their individual differences have become better articulated both for themselves and for the adults who work with them and watch them grow. Visitors commonly remark on their behavioral similarity to normal children. In an interesting and not altogether unsuspected way this project has shown that language, instead of habit training was, itself the major avenue to the development of social skills.

TRAINING AND MOTIVATING OF PERSONNEL

The first problem one may anticipate in introducing a language stimulation program of the sort described here is reluctance and even apprehension on the part of the ward personnel. Some of the technicians felt initially that their lot would be harder under the new regimen. They would have less adult companionship, since typically one of each pair would be working with individual children while the other worked with the rest of the group. Moreover, they would have to be interacting almost constantly with a group of severely retarded children for eight hours a day -- talking, listening, responding, directing.

A program such as this requires a drastic change of emphasis both in general approach and in minute-by-minute activity. All medical personnel, and especially the ward charge nurse (who is responsible for the overall administration of the ward) and the technicians, are asked in effect to change their primary emphasis from providing physical and custodial care to fostering the children's intellectual development. This shift requires adjustments in policies, attitudes, and practices. Naturally considerations of health and safety must be taken into account. But when the goal is environmental enrichment, training procedures aimed at developing intellect must take precedence over exaggerated concerns with medical procedures and aseptic conditions. Fixed notions about the number of hours of nap time needed, and so on, must also be open for revision. The revision leads to practices that are very different from what the usual hospital personnel have grown used to and from the procedures in the hospital at large. Furthermore, there is always the possibility of some feelings of displacement when other than nursing service employees are formulating or even playing an active role in making out ward schedules (subject, of course, to the approval of the medical director).

The word schedules appears again and again throughout this report, and rightly so, for a primary key to the success experienced in this program thus far lies in the fact that there were schedules and that they were enforced. The order in which children were to receive individual work, the time during which individual work was to occur, and the contents of the instruction, were rigorously scheduled. Ward classroom work -- the hours of its occurrence, and the content of instruction in very specific terms -- was rigorously scheduled. All routine ward activities also operated according to a schedule. Such scheduling was resented for the following reasons:

1) Specific activities were designated for specific periods of time, thus removing much of the element of choice.

2) The psychiatric technicians were required to interact

in a meaningful way with a group of retarded children over an extended period of time. This differs greatly from asking a psychiatric technician to supervise children merely to see that order is kept and injury to persons or property prevented.

3) The amount of time allotted for the completion of routine tasks, i.e., ward housekeeping duties, toileting of children, etc., was only as much as was absolutely necessary to accomplish these tasks.

4) The nurse in charge of the ward, who was normally involved in the administrative and supervisory aspects of ward operation, began not only to supervise the work of others but also to participate in this work, much of which was of a mundane, routine nature. Seeing that the ward schedules were adhered to was also part of her responsibility. Psychiatric technicians were now required to carry out work of an instructional nature, and such work in the past had not been part of the definition of their responsibilities.

5) By extending the children's waking hours, i.e., abolishing their two-hour afternoon nap and changing their bed time from 7:30 to 9:00 p.m., that portion of the work day of both the AM and PM shifts in which they had to deal in an active way with children was extended.

6) All tasks which could be carried out during the children's sleeping hours, i.e., linen folding, general cleaning, etc., were assigned to the PM and nightwatch personnel, thereby

increasing the work load of both shifts.

7) Pets (a dog, a parakeet, fish, turtles, and a guinea pig) were incorporated into the ward setting, thereby increasing the responsibilities of the psychiatric technicians.

However, no matter how justified was this resentment of schedules, it has been our experience that instructional input must be consistent over time and it must be considerable. This implies hard work of a particular nature and involves isolation of the technician in an instructional situation with a group of severely retarded children. Most people will not voluntarily place themselves in such a situation with any degree of consistency and regularity -- hence, the necessity for schedules and for adherence to them.

Furthermore, to evaluate the effectiveness of teaching, one must know how much of what instructional activities have been presented to the children. In the presence of a schedule of activities which has been actually followed, one is in a position to make judgments relative to the effectiveness of the instruction being offered.

Also, in the natural course of events, what usually happens on any ward is that children who have the most appeal receive the benefit of whatever positive adult-child interactions take place. These children are usually few in number, while the major proportion of patients receive little of such attention. Scheduling of standard periods of individual work, where the child to be worked with and the content of instruction were designated, allowed all patients to receive equal periods of meaningful adult attention.

How well was the program accepted? On the whole, it was accepted remarkably well. Of 26 technicians who were employed on the ward off and on during the two and a half year period, only two transferred or resigned because of verbalized apprehension about their ability to perform the work. As well as could be determined, the turnover rate was no greater than that prevailing in the rest of the hospital.

This acceptance was due in part to some practical attempts to alleviate technicians' burdens. Frequent breaks were scheduled, activities were changed approximately every 15 minutes, and technicians were shifted from individual to group work, and from work with the mongoloid children to work with the PKU children who were housed on the same ward.

Efforts expended to anticipate the feelings which the ward staff were apt to experience in response to the many changes being made and to explain to them as fully as possible the rationale of the program and the crucial role they played in it were of great importance.

They participated in the formulation of realistic schedules -- schedules which walked that fine line which separates a condition that is so full of pressure as to create nonproductive tension from that condition to which Parkinson's law may apply, e.g., work expands to fill the time allotted to it.

The greatest contribution to technician acceptance was doubtless the observable progress of the children. Their changing perception of their role was due to pride in accomplishment and a growing sense of the appealing human qualities of each child. As the children became better individuated and more communicative, the technicians found them more rewarding to work with. The technicians were justifiably proud of this change, for which they deserved a major share of the credit. A typical reaction was that of one technician who, when transferred to another ward in the hospital proper, reported that the daily lives there of many of the mongoloid children -- mute and recalcitrant -- were "an awful waste." Another technician admitted that, although at the outset she thought the language stimulation was pointless, she gradually changed her mind; she now goes so far as to describe what has been accomplished with the Special Projects' children as "a miracle."

More objective evidence of interest was the attempt of several technicians entirely on their own to construct and collect additional pictorial material to supplement the ward's resources or to take the children for visits to their homes. Although the work was in some ways more demanding, it was also more gratifying. Instead of chasing children around the dayhall, the technicians were helping them learn and seeing daily evidence of progress.

The training on this project was brief but specific.

During the first month of the program the consultant trained the technicians and appropriate research personnel in language stimulation techniques. Several months later articulation training was demonstrated for these personnel using the children themselves. The professional personnel involved in the project have since cooperatively trained the paraprofessional personnel. Whenever a new ward classroom schedule was made up, each activity was explained to both the morning and afternoon staff.

For technicians who joined the staff after the initial phase, the following general procedure was followed: Each new technician was given a briefing in which the following things were explained: a) a history of the program and its aims; b) the guidelines for standards and discipline as they were currently being interpreted; c) the use of the reading books and work-sheets; d) the use of articulation techniques as demonstrated on several children; and e) the use of articulation materials, including the notebook. Each technician spent several days observing in the classroom before plunging in on her own. Much of the technician's training was given on the job as specific questions arose and were clarified. The technicians kept careful records on the progress of each child in the reading books and work-sheet series, and the time spent in individual sessions was carefully recorded. These records served as one basis for follow-up, the other being occasional informal classroom observation.

ACCOMPLISHMENTS AND PROSPECTS

To use the words of Nancy Bayley in describing the mongoloid project at Sonoma:

> This study of children with a diagnosed defect which is known drastically to limit intellectual potential gives us clear evidence for the importance to intelligence of the right kind of environment. In this instance the effective environmental instrument has been emphasis on meaningful verbal communication and interactions with the persons and in the situations which are continuing and significant aspects of their daily life.
>
> (Bayley, 1967, p.25)

In summary, the following are the major accomplishments of this project to date:

1) It has demonstrated how destructive to mental growth the routine hospital environment is, even with an excellent staff/patient ratio.

2) It has indicated the area of development that suffers most acutely under this kind of regime -- the area of language, which appears to be the key to the development of any constructive

intellectual and social behavior.

3) It has shown not only that severely retarded mongoloids with measured IQ's as low as 32 can be taught to read and comprehend what they are reading, but also that the amount of time, energy, and expense required is not prohibitive. No increase in this staff beyond the 1 to 5 ratio was required. All that was needed was simply a different deployment of staff time, including the refocusing of research personnel's responsibilities to include the setting up and supervision of this program.

4) It has suggested that in providing an enrichment program one must not impose artificial ceilings on potentialities by setting one's expectations too low. It may even help to be unreasonably optimistic.

Several professional staff members can offer testimony to this last point. One of us summarized it this way in a recent speech; "Although we did not foreclose on possibilities, our initial goals were limited. The children trained us to raise our expectations of their capabilities. As a result of this intensive program it has been shown that they are capable of tremendous advances -- advances that none of us could have dared forecast at the outset."

Another of the authors, the children's hospital school teacher, also reflects this belief. "I must admit," she recently wrote,"that I was more than doubtful when I was asked in the autumn of 1966 if I would be willing to experiment with teaching the children to read. I had been a teacher here at Sonoma State Hospital for four years, had dealt with many different kinds of retarded children, and was known as unrealistically optimistic about what could be done with them. It is clear at present that not one of the nine children involved in this reading program has in any way reached his limit in this skill. We cannot tell how far the children will go, and certainly the most complex, abstract, and problematic areas of reading are ahead of us. But I don't think any of us involved in this program would have dared believe that the children would go this far. The ending," she concludes, "is yet open."

Because of these unforeseen gains, no one on the Special Projects' staff is about to set an arbitrary limit on what these children now can or will learn. Among the innovations being used or contemplated is programmed instruction via teaching machines to handle some of the reading. New reading units are being prepared and at the same time a diligent search is being made to see if a standard series can be adapted for the children, so that professional staff time and effort can now be devoted to aspects of the program other than the time-consuming composition of written materials.

Written communication will also be tried. Writing appears difficult for such children, although two of them have begun printing their names and various consonants. The use of a typewriter may provide a solution for written communication (see typewritten diary of a mongoloid child contained in Seagoe, 1964, and The World of Nigel Hunt, 1968). In the school classroom greater emphasis will be placed on more subtle auditory and visual discriminations in reading and on helping each child to enlarge his sense of autonomy.

The overall hope is to maintain this group of children as a special research group with which to try out new materials and techniques. The group should serve as a model for setting educational objectives for the severely retarded. How far can we take these children? We do not know, but we hope to find out. What is known is that any attempt to lump all mongoloid children into one category of severely retarded -- trainable at best -- is invalid. The mongoloid range is limited, but it *is* a range. Furthermore, one cannot postulate the upper limits of that range in advance of an enrichment program. This is particularly true if, as many believe, intellectual gains are multiplicative: that is, if the acquisition of structures or schemata makes possible the acquisition of still other and more complex structures, and so on. Ultimately it is conceivable that such children could find their way into supervised community settings instead of being confined to nonproductive and unhappy existence in state hospitals. Not only does a program such as this have theoretical implications, but it also has practical consequences; whatever their ultimate level of achievement and social interaction, the children are leading lives that presently are more stimulating and happier for them and more gratifying for those who work with them. The economic implications to the taxpayer which are forthcoming from the success of this program are important in that the more self-sufficient a child can become the less will be the level of lifetime care which the State will have to provide.

While the ultimate accomplishments of such a language stimulation program are not specifiable, it has obvious possibilities for extension in many other situations in which language deficits have prevented crucial learning and the consequent development of self-esteem. Techniques used in this program have occasionally been borrowed by teachers working with abler retardates in Sonoma State Hospital. For example, one such teacher visiting the school classroom observed with surprise the involvement, interest, and confidence displayed in their reading by the Special Projects' mongoloids. The teacher's older and abler group had been working its way with difficulty and boredom through standard primers and pre-primers. When she introduced the Special Projects' reading series (with appropriate modifications) to her group, she noted that her children began progressing more rapidly and with much greater satisfaction.

The major premises of this program -- the primary emphasis placed on language development, intensive environmental stimulation, concept-orientation, immediacy and relevance of text materials, built-in feedback and reinforcement, and a sequenced approach --

are certainly applicable beyond the hospital setting. As many are recognizing, the culturally disadvantaged as well as the mentally retarded of many varieties could benefit and are benefiting from an intensive attack on the root language difficulty. In fact, with children in whom deprivation is less severe and native potential is higher than in the Special Projects' mongoloids, one could expect improvement at an even more rapidly accelerating rate.

REFERENCES

Bayley, N. The two-year old. Duke University Book Store, Durham, North Carolina: The Durham Education Improvement Program, 1967.

Bayley, N., Rhodes, L., Gooch, B., and Marcus, M. Environmental factors in the development of institutionalized infants, prepublication copy, 1969.

Bayley, N. Scales of infant development. New York: The Psychological Corporation, 1969.

Centerwall, S. A., and Centerwall, W. R. A study of children with mongolism reared in the home compared to those reared away from home. Pediatrics, 1960, 25, 678-685.

Dameron, L. E. Development of intelligence of infants with mongolism. Child Development, 1963, 34, 733-738.

Deutsch, M. Social and psychological perspectives on the development of the disadvantaged learner. Journal of Negro Education, 1964, (Summer), p. 234-239.

Doll, E. A. Vineland social maturity scale. Nashville: Educational Test Bureau, 1957.

Goldstein, Herbert. From an address entitled "Pre-school programs for the retarded," delivered at a symposium on "Mental Retardation: Recent Advances and Their Implication for Treatment" in November 13-15, 1964, at the University of California School of Medicine, San Francisco Medical Center.

Hunt, J. McV. Intelligence and experience. New York: Ronald Press, 1961.

Hunt, Nigel. The world of Nigel Hunt. New York: Garrett Publications, 1967.

Kirk, S. A. Early education of the mentally retarded: an experimental study. Urbana: University of Illinois Press, 1958.

Koch, R., Graliker, B., Bronston, W., and Fishler, K. Mental retardation in early childhood: a longitudinal study of 143 infants. American Journal of Diseases of Children, 1965, 109, 234-251.

Kugel, R. B. and Reque, D. A. A comparison of mongoloid children. Journal of the American Medical Association, 1961, 175, 959-961.

Lenneberg, E. H., Nichols, I.A., and Rosenberger, E. F. Primitive stages of language development in mongolism. In Disorders of Communication, Vol. XLII: Research Publications, A.R.N.M.D., Baltimore: Williams and Wilkins, 1964.

Seagoe, M. V. Yesterday was Tuesday, all day and all night: the story of a unique education. Boston: Little Brown, 1964.

Shotwell, A. M. and Shipe, D. Effect of out-of-home care on the intellectual and social development of mongoloid children. American Journal of Mental Deficiency, 1964, 68, 693-699.

Stedman, D. J., and Eichorn, D. A comparison of the growth and development of institutionalized and home-reared mongoloids during infancy and early childhood. American Journal of Mental Deficiency, 1964, 69, 391-401.

Tizard, J. Residential care of mentally handicapped children. British Medical Journal, April 2, 1964, 1041-1046.

Appendix A

SAMPLE READING WORKSHEETS

moon

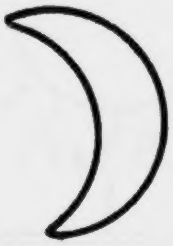
sun

stars

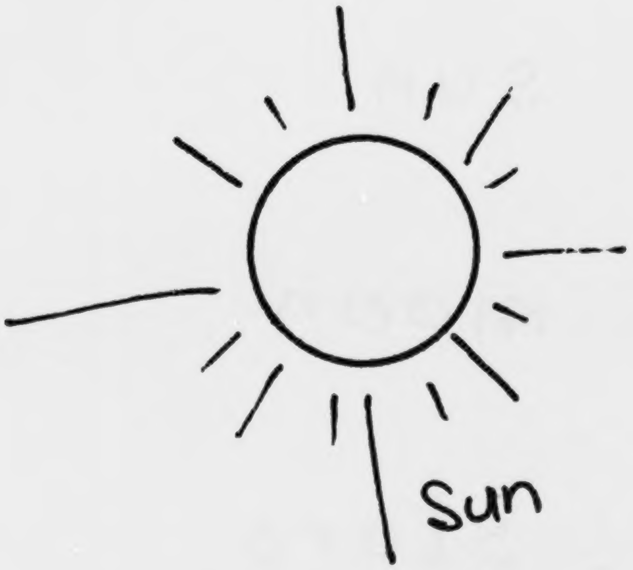
moon

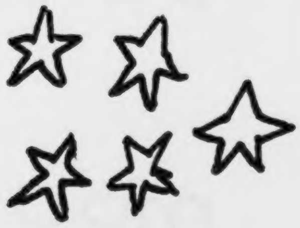
sun

stars



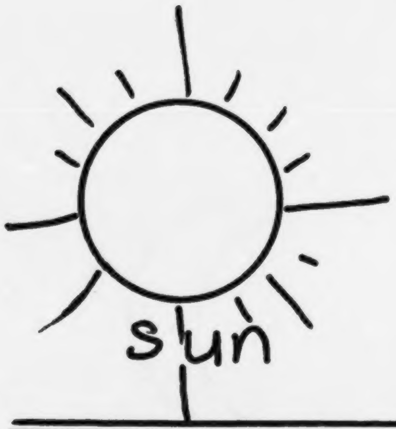
moon

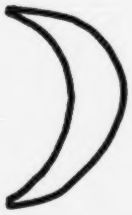


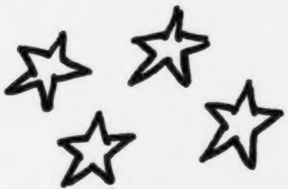


stars

Appendix A-1

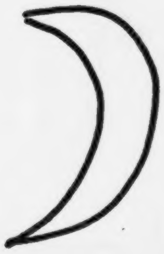






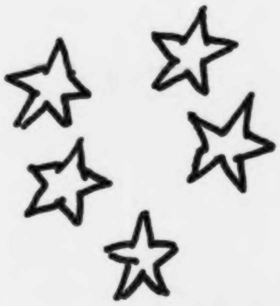
sun moon stars

stars



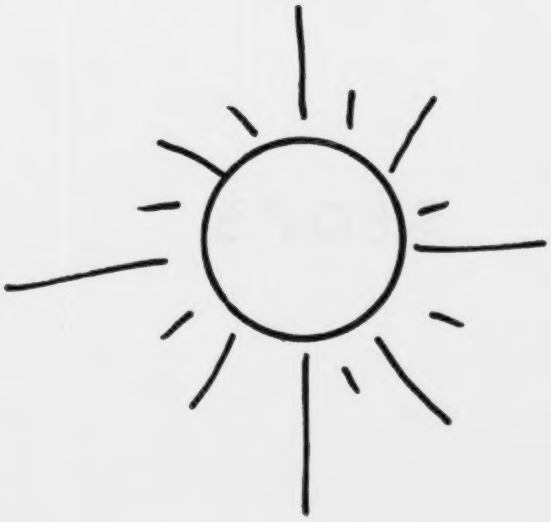
sun

moon



stars

sun



moon

Appendix A-2

sun

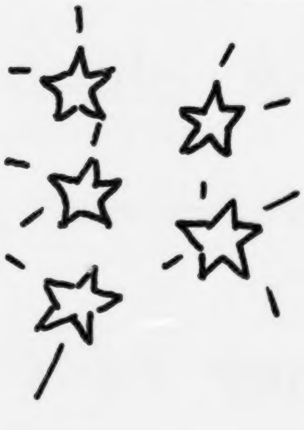
stars

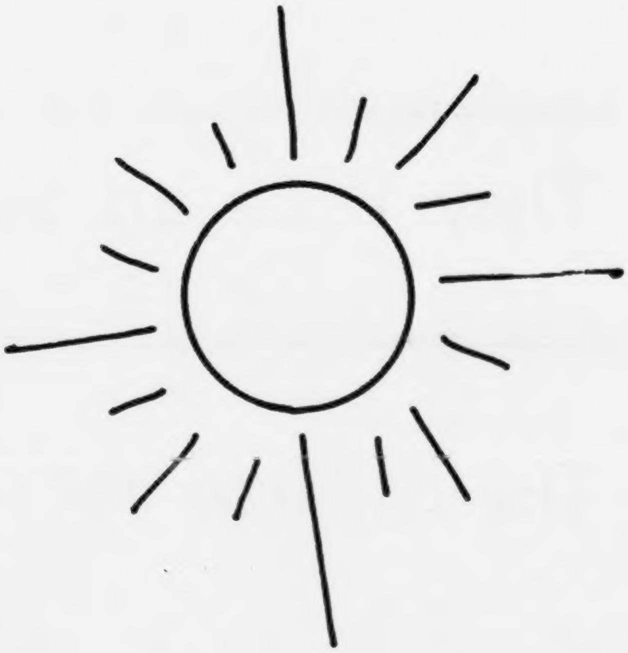
moon

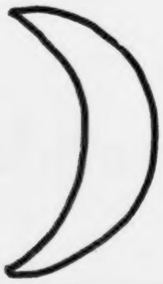
stars

sun

moon



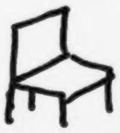


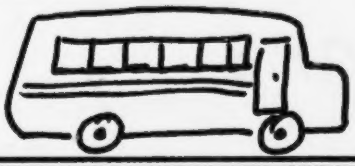


Appendix B

The children go to the ___.
farm
yard

They ride on the ___.

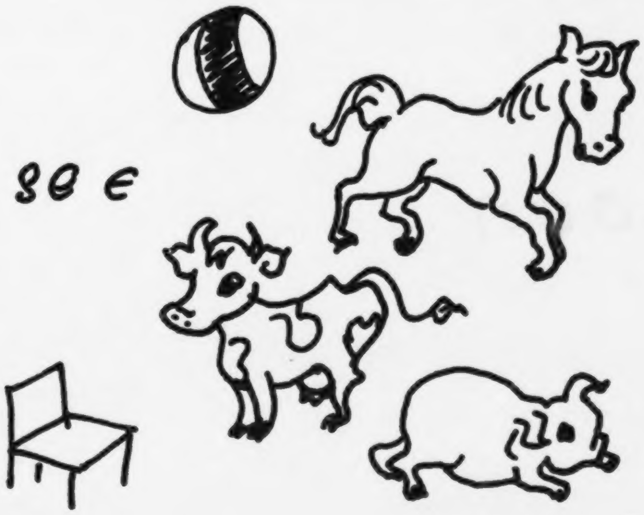




They ride on the ___.
bus
chair

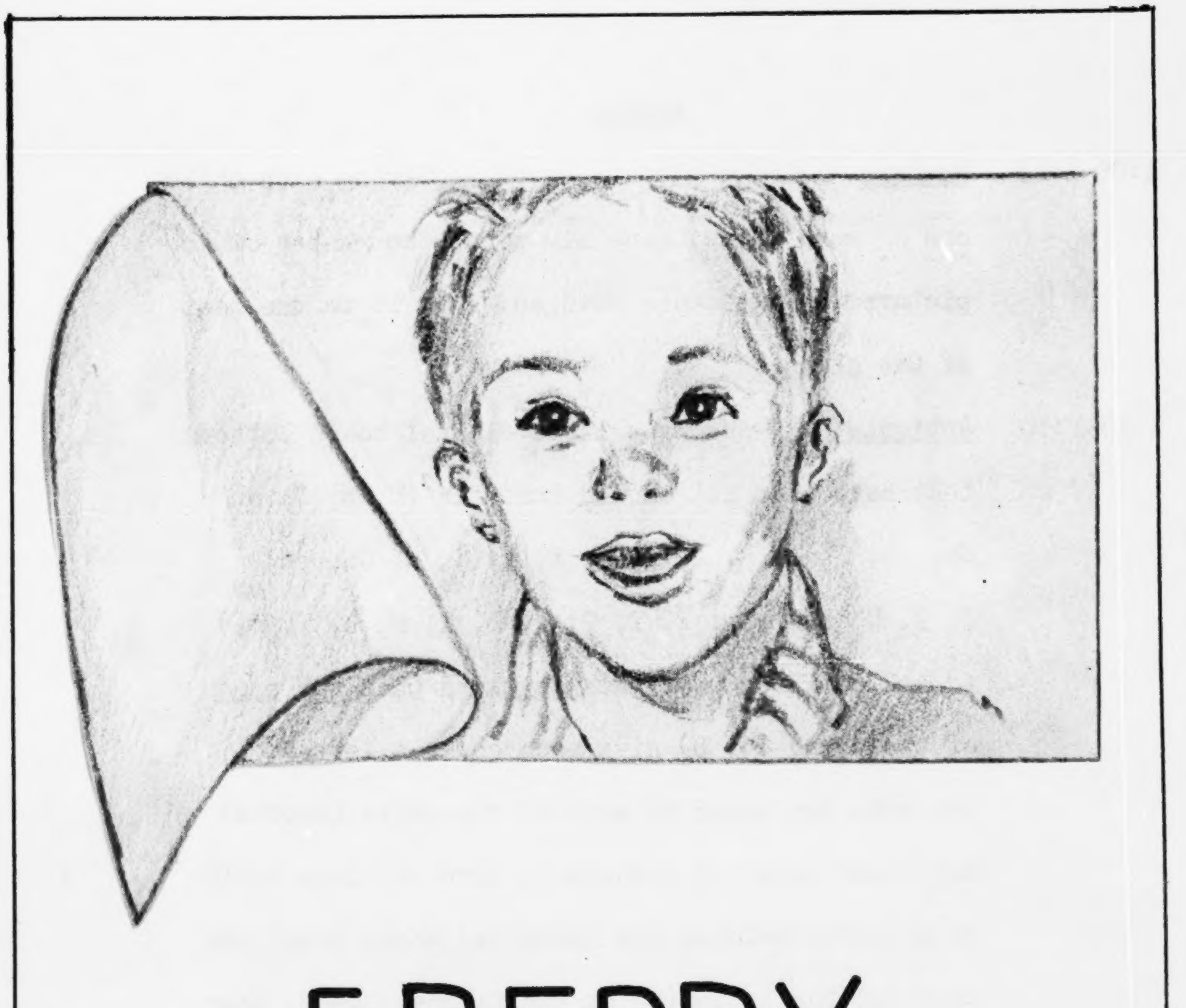
The children see a ___.
ball chair
horse book
pig cow

The children see a ___.



Appendix C

SAMPLE PAGE FROM BOOK 1



FREDDY
DOYLE

Appendix D

SAMPLE SCHEDULE OF WARD CLASSROOM ACTIVITIES

FOR 1967 - 1968 (Two days)

Monday

1:00-1:15 Numbers - Number picture cards -- Giving each child one or more turns, have him count the number of pictures on a picture card and show it to the rest of the class.

1:15-1:30 Articulation - Using all the flannel board letters that have been introduced thus far (P, p, N, n, Sh, sh, S, s, R, r, B, b, K, k, Z, z, Ch, ch, J, j, D, d, M, m, F, f, G, g, L, l, H, h, T, t,) a) ask children what each says and what the name of the sound is, b) give each child a letter; you make the sound of each of the pairs (capital and lower case) of letters in turn and have child or children holding the letter(s) whose sound you made put the letter(s) on the flannel board; then ask group or child to make _____ sound and ask where they feel the sound, i.e., on the throat (motor on), in front of mouth, or on the side of the nose.

1:30-1:50 Reading - a) Have children match flashcards with pictures using flannel board. Use group one words and pictures. b) Give one flashcard to each child (tell him word if he can't read it). Call out a word. Child is to stand when his word is called.

Make game move as quickly as possible. Use group one words.

1:50-2:00 Toilet children.

2:00-2:15 Language - Use smaller flannel backed picture cards; have children name and put on flannel board.

2:15-2:30 Songs, finger plays and group games.

2:30-2:50 Special Activity - a) Using heavy grocery box and taking children one at a time, have child sit in, on (and/or on top of), under, beside (and/or next to) the box. b) Use a small object and a hat or box. Have child put object in, (and/or on top of), under, beside (or next to) the hat or box and up in the air or down on the floor.

3:00-3:15 Reading - Flashcards on flannel board -- tell child to get or find a particular word and let him show it to rest of class. Use group one words.

3:15-3:30 Rhythm - Use one of directional records.

3:30-3:45 Language - Bag-Feel game -- Place one object in a paper or cloth bag and have child feel it and tell other children what is in the bag.

3:45-4:00 Special Activity - Farm Scene - a) Give out flashcards from envelope labeled Farm Scene and have children put by proper figure in scene and/or b) with farm scene beside you, print one of the following commands on the blackboard and have child read and do as it says. 1. Give me, or name of one child the horse, dog, man, girl, cow, pig, cat, boy. Put the cow, horse, man, pig, dog, cat, boy, girl, in, on, under the table, chair. 3. Put the man, pig, dog, girl, boy, horse, cat, cow in the barn.

4:00-4:15 Articulation - Using small picture cards which correspond with the sounds for p, n, sh, s, and r in the initial position, put all or most of the cards up on the flannel board and have children select all those pictures which start with, for example, the popping sound, treating each of the above sounds and its pictures in the same way.

4:15-4:30 Toytime - Booktime.

5:30-5:45 Reading - Use cards (group one words) which have word on one side and picture on the other. Show child the word and ask him to read it. He may then turn the card over to see if it is right. Don't let him look at the back until he has given his best effort.

5:45-6:00 Language - Use action pictures. Ask, "What is he or she doing" "What is happening?"

6:00-6:15 Articulation - Use the ring stand charts with pictures of things beginning with the b, l, p, k, d, and s sounds. Ask children as a group and/or individually to name the pictures, all the while talking about the name of that sound and over emphasizing in your speech the production of that sound.

6:15-6:30 Special Activity - Categories of things-sorting. Have child sort the pictures or pick out (for example) all round things, etc. OR may pass out pictures in the category and tell all those who have pictures of round things to come and put on flannel board, etc. Use following categories: a) Round things-square things; b) boys-girls; c) men-women (or ladies).

6:30-6:45 Numbers - Apples on the Tree Game. Put tree up on flannel board. Giving each child a turn, let him or her draw a number from the number box and then hang that many apples onto the tree.

6:45-7:00 Songs, fingerplays, group games.

7:00-7:15 Toilet children.

7:15-7:30 Rhythm - Dancing - Put on a good dance record, give one child a rhythm stick and tell him to dance until his turn is done, at which time he is to give the stick to someone else so they may take a turn.

7:30-7:45 Special Activity - Pictures of Day and Night Scenes - Hold up each card in turn and about each ask the question, "Is it daytime or night time in this picture?"

7:45-8:00 Storytime - Read or tell the children a story.

Tuesday

1:00-1:15 Numbers - Apples on the Tree Game - Put tree up on flannel board. Giving each child a turn, let him or her draw a number from the number box and then hang that many apples onto the tree.

1:15-1:30 Articulation - Using all the flannel board letters that have been introduced thus far (P, p, N, n, Sh, sh, S, s, R, r, B, b, K, k, Z, z, ch, Ch, J, j, D, d, M, m, F, f, G, g, L, l, h, H, T, t,) a) ask children what each says and what the name of that sound is, b) give each child a letter; you make the sound of each of the pairs of letters in turn and have child or children holding the letter(s) whose sound you made put the letter(s) on the flannel board; then ask group or child to make the _____ sound and ask where they feel the sound, i.e., on the throat (motor on) in front of mouth, or on the nose.

1:30-1:50 Reading - a) Flashcards on flannel board - tell child to get or find a word or more than one word. Use group two words. b) One flashcard to each child, call out word. Child stands when word is called. Make game move as quickly as possible.

1:50-2:00 Toilet children.

2:00-2:15 Language - Use action pictures - Ask "What is he or she doing? What is happening?"

2:15-2:30 Songs, fingerplays, group games.

2:30-2:50 Special Activity - Magnetic board day and night scenes. Set up the magnetic board so:

daytime night time

Take out the magnet backed pictures and about each ask a child or all the children, "Does this picture go with the daytime or night time?" and help them to categorize it correctly, explaining why each picture or scene belongs to the day or the night.

3:00-3:15 Reading - Have children match flashcards with words on tagboard sheets. Use group two words.

3:15-3:30 Rhythm - Pick a record with a definite beat and get children to clap hands, stamp feet, beat instrument on beat.

3:30-3:45 Language - What Box - Have children name objects in it.

3:45-4:00 Special Activity - Pictures of day and night scenes - Hold up each card in turn and about each ask the question, "Is it daytime or night time in the picture?"

4:00-4:15 Articulation - Use small picture cards which correspond with the sounds for sh, r, b, k, z, and p in the initial position, put all or most of the cards up on the flannel board and have children select all those pictures which start with, for example, the bubble sound, treating each of the above sounds and its pictures in the same way.

4:15-4:30 Toytime-Booktime.

5:30-5:45 Reading - Use cards (group one words) which have word on one side and picture on the other. Show child the word and ask him to read it. He may then turn the card over to see if it is right. Don't let him look at the back until he has given his best effort.

5:45-6:00 Language - Use action pictures. Ask, "What is he or she doing" "What is happening?"

6:00-6:15 Articulation - Use the ring stand charts with pictures of things beginning with the b, l, p, k, d, and s sounds. Ask children as a group and/or individually to name the pictures, all the while talking about the name of that sound and overemphasizing in your speech the production of that sound.

6:15-6:30 Special Activity - Categories of things-sorting. Have child sort the pictures or pick out (for example) all round things, etc. OR may pass out pictures in the category and tell all those who have pictures of round things to come and put on flannel board, etc. Use following categories: a) Round things-square things; b) boys-girls; c) men-women (or ladies).

6:30-6:45 *Numbers* - Apples on the Tree Game. Put tree up on flannel board. Giving each child a turn, let him or her draw a number from the number box and then hang that many apples onto the tree.

6:45-7:00 Songs, fingerplays, group games.

7:00-7:15 Toilet children.

7:15-7:30 *Rhythm* - Dancing - Put on a good dance record, give one child a rhythm stick and tell him to dance until his turn is done, at which time he is to give the stick to someone else so they may take a turn.

7:30-7:45 *Special Activity* - Pictures of Day and Night Scenes - Hold up each card in turn and about each ask the question, "Is it daytime or night time in this picture?"

7:45-8:00 Storytime - Read or tell the children a story.

Appendix E

GENERALIZED DAILY SCHEDULE

1967 - 1968

Staff duty roster

6:30 a.m.-3:00 p.m.	Two to three technicians and the charge nurse (or a technician who is relieving for her) are on duty. The charge nurse is responsible for the PKU children and provides direct medical supervision where it is needed; she is assisted in the morning by one of the technicians. The one to two technicians during the a.m. hours and the two to three technicians during the p.m. hours are responsible for the care of the eleven mongoloid children.
3:00 p.m.-11:00 p.m.	Personnel changes but numbers and responsibilities remain the same.
11:00 p.m.-6:30 a.m.	One person is on duty, responsible for both mongoloid and PKU children.

Children's schedule[1]

a.m.

6:30-8:00	Children are awakened; toileting, breakfast, dressing for children and coffee breaks for

---

[1] In the summer, when the hospital school does not operate other activities are substituted, including outdoor play in the yard and the wading pool. Similar substitutions are made on weekends during the school year.

	morning service personnel.
8:15-11:00	Children board school bus for hospital school; after two and one-half hours of instruction they are returned to the ward.
11:00-11:30	Children have active play in the dayhall.
11:30 a.m.-1:00 p.m.	Technicians eat lunch and give children lunch, plus more active play outside or in dayhall.
p.m.	
1:00-4:30	Individual work and group activities in ward classroom, interspersed with two short breaks for toileting (for examples see Appendix D).
4:30-5:30	Dinner for children and staff.
5:30-8:00	Individual and group activities (see Appendix D).
8:00-8:30 or 8:45	Bathing, toileting, undressing, and bed.

Figure 1

Individual Curves of IQ for 3 Subjects of Differing Abilities

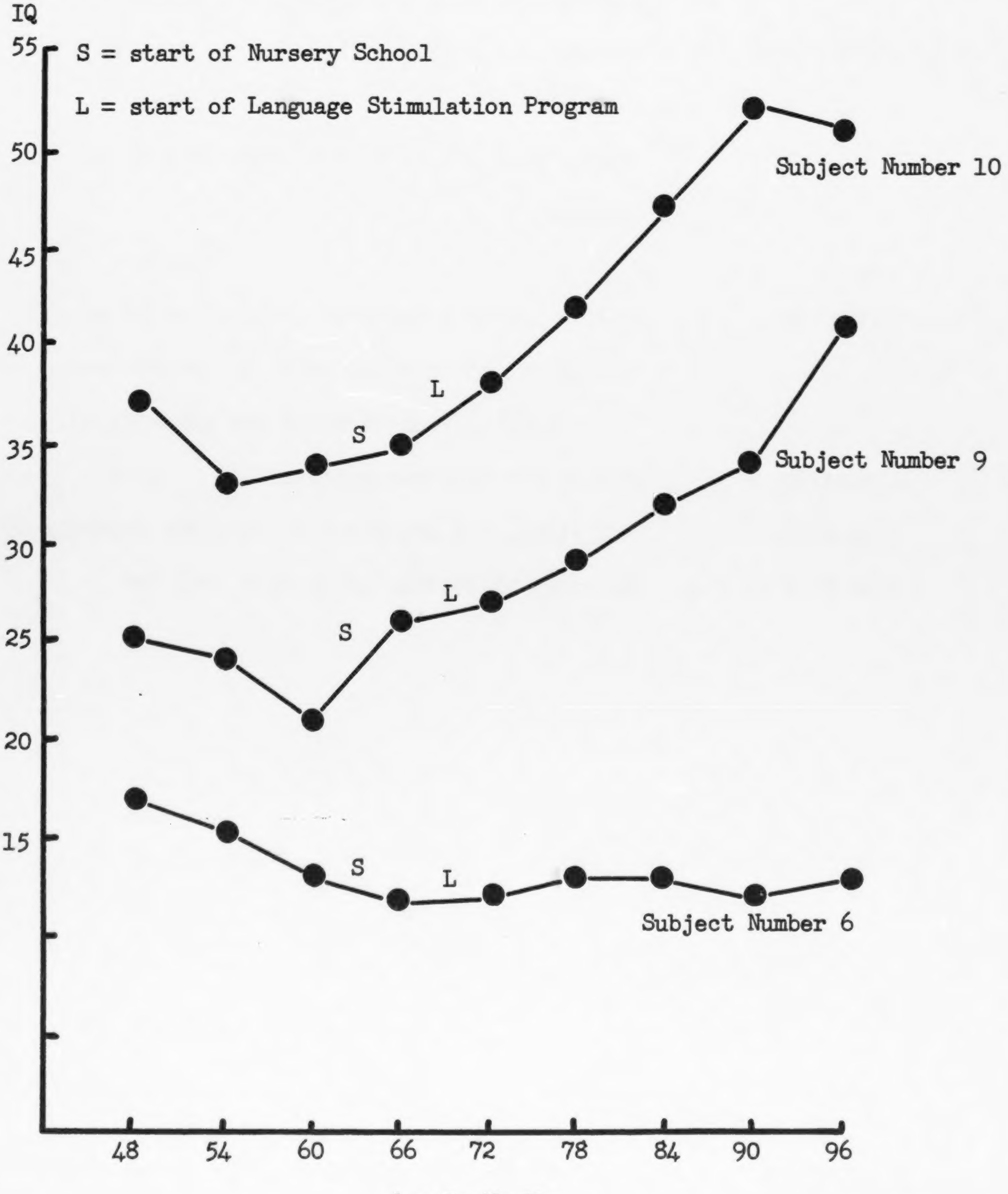


Table 1

INDIVIDUAL PROGRESS OF CHILDREN IN READING PROGRAM MARCH, 1967, TO FEBRUARY, 1968, INCLUSIVE[1]

	Subject Numbers								
	1	2	3	4	5	7	8	9	10
March 1967									
Hours Worked	2.5	2.5	2.5	1.5	2.5	2.5	2.5	2.5	2.0
Dittos	1-10	1-2	1-14	1-6	1-13	1-6	1-29	1-24	1-24
Reading Books	1	-	1&2	-	1	1	1,2&3	1,2&3	1
April 1967									
Hours Worked	9.0	8.5	8.5	3.5	8.0	7.5	9.0	8.0	6.5
Dittos	11-29	3-6	15-32	7-13	14-32	7-24	30-47	25-44	25-60
Reading Books	2	-	3	1	2	2	4&5	4&5	2,3&4
May 1967									
Hours Worked	5.5	5.5	5.5	5.5	5.0	5.5	6.0	5.5	5.5
Dittos	30-50	7-10	33-44	14-27	33-39	25-34	48-73	45-72	61-72
Reading Books	3	-	4&5	2	3,4&5	3&4	6	6	5&6
June 1967									
Hours Worked	4.5	4.5	6.0	3.0	5.0	5.0	6.0	5.0	3.5
Dittos	51-61	11-12	45-66	28-35	40-57	35-52	74-87	73-78	73-76
Reading Books	4&5	1	-	3	6	5	7A&7B	7A&7B	-
July 1967									
Hours Worked	9.5	10.5	10.5	3.5	10.0	10.5	12.0	10.0	9.5
Dittos	62-84	13-16	67-91	36-43	58-79	53-74	88-94	79-91	77-89
Reading Books	6&7A	-	6	4	-	6	-	-	7A&7B
August 1967									
Hours Worked	17.0	16.5	16.5	14.0	17.5	13.0	18.0	15.5	15.5
Dittos	85-119	17-26	92-124	44-73	80-127	75-115	95-130	92-131	90-130
Reading Books	7B	2	7A&7B	5&6	7A&7B	7A&7B	8A&8B	8A&8B	8A&8B

Table 1 cont'd.

September 1967									
Hours Worked	9.0	7.5	10.0	7.5	9.0	9.0	10.0	9.5	9.5
Dittos	120-137	27-35	125-135	74-89	128-141	116-130	131-145	132-141	131-145
Reading Books	8A&8B	-	8A	7A	8A&8B	8A	9A	9A	9A
October 1967									
Hours Worked	8.5	9.0	9.0	6.5	9.0	8.5	9.0	8.5	8.0
Dittos	138-143	36-47	136-142	90-113	142-150	131-143	146-149	142-148	146-152
Reading Books	-	3&4	8B	7B	9A	8B	9B	9B&10A	9B
November 1967									
Hours Worked	2.0	3.0	3.0	2.5	3.0	2.5	3.0	2.5	2.5
Dittos	144-149	48-53	143-147	114-123	151-156	144-151	150-154	149-155	153-158
Reading Books	9A	5	9A	8A	9B	9A	10A	-	10A
December 1967									
Hours Worked	4.0	5.0	5.0	3.0	5.0	5.0	4.5	4.5	4.5
Dittos	150-154	54-60	148-152	124-128	157-161	152-159	155-159	156-162	159-162
Reading Books	-	-	-	-	-	9B	10B	-	10B
January 1968									
Hours Worked	3.0	3.5	5.0	2.5	3.0	4.5	5.0	5.0	5.0
Dittos	155-164	61-74	153-161	129-131	162-165	160-165	160-165	163-170	163-170
Reading Books	9B	6	9B	8B	10A	10A	-	10B	-
February 1968									
Hours Worked	10.5	11.0	7.0	4.5	11.0	11.0	10.0	11.0	11.0
Dittos	165-170	75-96	162-170	132-141	166-170	166-170	166-170	-	-
Reading Books	10A	-	10A	-	10B	10B	-	-	-
TOTALS									
Hours Worked	85.0	87.0	88.5	57.5	88.0	84.5	95.0	87.5	83.0
Dittos	170	96	170	141	170	170	170	170	170
Reading Books	13	6	13	10	14	14	14	14	14

Hours Worked - The number of hours of individual work each child received each month.
Dittos - The range of dittos completed each month (170 maximum total).
Reading Books - Units of reading books completed each month (14 maximum total).

1 Subject number 6 is not included in this table. This is Walter who is still essentially mute and whose individual work sessions did not include instruction with the reading books or dittos.

Table 2

ERRORS IN ARTICULATION SCREENING TEST, NOVEMBER 1965[1] vs. JULY 1967

	Subject Number									
	1	2	3	4	5	7	8	9	10	Mean
Substitutions:										
Test 1	26	35	30	25	22	30	30	40	28	30
Test 2	13	16	29	31	21	10	17	34	17	21
Distortions:										
Test 1	9	2	6	5	9	3	3	3	5	5
Test 2	12	8	9	2	16	14	7	1	7	8
Omissions:										
Test 1	16	10	26	16	33	17	13	18	17	18
Test 2	0	0	5	4	6	2	2	7	2	3
Total:										
Test 1	51	47	62	46	64	50	46	61	50	53
Test 2	25	24	43	37	43	26	26	42	26	32
% of Improvement (Total)	51	49	31	20	33	48	43	31	48	40
Probability[2]	<.001	<.001	<.001	<.10	<.001	<.001	<.001	<.001	<.001	<.001

1 Subject number 6 (Walter) is not included in this table. He is still nonverbal and has therefore not received articulation correction therapy.

2 McNemar Test for Significance of Changes

Test 1, November, 1965
Test 2, July, 1967

Table 3

PERCENTAGE OF SPONTANEOUS WORD COMBINATIONS OBSERVED DURING DEVELOPMENTAL TESTING[1]

Subject	6 months after start of program		12 months after start of program		18 months after start of program		24 months after start of program	
	% of word combinations	Total words	% of word combinations	Total words	% of word combinations	Total words	% of word combinations	Total words
1	12	107	28	116	37	77	61	303
2	23	87	34	88	35	93	65	200
3	7	61	19	92	20	93	57	219
4	21	98	18	70	21	54	65	224
5	14	49	9	54	45	102	63	210
7	14	61	13	84	28	154	61	242
8	25	92	43	88	48	125	61	158
9	15	96	12	65	25	76	51	209
10	14	85	9	56	30	111	27	113
Group Mean	16	82	21	79	32	98	57	209

[1] Subject number 6 is not included in this table because he is still nonverbal.

Table 4

RESULTS OF PEABODY PICTURE VOCABULARY TEST[1]

	Number of items passed	CA in months	MA in months	RIQ[2]
Test #1 - July, 1965 (Start of program)	5.4	69	21	31
Test #2 - Dec. 1965 (5 mos. into program)	12.1	74	26	35
Test #3 - April, 1966 (9 mos. into program)	15.8	78	28	36
Test #4 - Feb. 1967 to Jan. 1968 (19 to 30 mos. into program)	26.7	96	35	36

Tests 1, 2, and 3 are Form A; test 4 is Form B.

[1] Tests 1, 2 and 3 are results obtained with the 9 of the 10 children who are talking and reading. Test 4 are results obtained with those six children who had received the test (given at CA 8 years) at the time of the writing of this report

[2] RIQ - ratio IQ. The deviation IQs given in the manual are not standardized for this level of mental age functioning.

Table 5

INTELLIGENCE QUOTIENTS OVER THE FIRST 2 1/2 YEARS OF THE PROGRAM

Subject Number	CA at Start of Program	IQ at Start of Program	IQ at 6 mos. After Start of Program	IQ 1 Year After Start of Program	IQ 2 1/2 Years After Start of Program
1	60 months	35*	45	50	51
2	62 months	32*	35*	44*	36
3	65 months	33*	39	44	43
4	65 months	34*	47	48	45
5	69 months	26*	31*	29	38
7	74 months	23*	31*	30*	34
8	74 months	31*	43	43	42
9	76 months	26*	31*	38	41
10	76 months	39*	44	51	48
Mean		31.0	38.4	41.9	42.0

Mean Difference = 11.0

$t^{**} = 4.390$

$p = < .005$

* Revised Bayley Scales of Infant Development (Mental Section, 1969 norms). The remainder of the scores reported were obtained on the Stanford Binet (L-M). At the point where the two scales overlap (groups aged 24, 27, or 30 months) the mean difference in mental age is 1.1 month, with the Binet yielding a higher score (Bayley, 1969).

** t test compares IQ at start of program and IQ $2\frac{1}{2}$ years after start of program. Subject 6 has maintained a stable IQ of about 14 on the Bayley Scales.

CALIFORNIA MENTAL HEALTH RESEARCH MONOGRAPHS

Single copies of the following publications are available on request without charge.

Send request to:

Alden B. Mills, Editor
Scientific Publications
California Department of Mental Hygiene
744 P Street
Sacramento, California 95814

3—Evolution of Treatment Methods at a Hospital for the Mental Retarded, by Esther M. Pond and Stuart A. Brody: 1965.

5—Recidivism Among Treated Sex Offenders, by Louise V. Frisbie and Ernest H. Dondis: 1965.

6—Worlds that Fail: Part I—Retrospective Analysis of Mental Patients' Careers, by Dorothy Miller: 1965.

9—The Significance of Life-Goals in Aging Adjustment—A Pilot Study, by Gerard A. Brisette: 1967.

10—Psychiatric Evaluation and Treatment of Patients with Major Speech Handicaps—Peter F. Ostwald: 1969.

11—A Language Stimulation and Reading Program For Severely Retarded Mongoloid Children: A Descriptive Report—Leanne Rhodes, MA; Bill Gooch; Ellen Y. Siegelman, PhD; Charlene (Alton) Behrns, MEd; Reva Metzger, BA: 1969.

CALIFORNIA MENTAL HEALTH RESEARCH SYMPOSIA

1—Reinforcement Theory in Psychological Treatment—A Symposium, edited by Jerome Fisher and Robert E. Harris: 1966 (Published as California Mental Health Research Monograph No. 8).

2—Behavior Theory and Therapy, by C. Eugene Walker, O. Ivar Lovaas, J. Richard Metz, Joseph Wolpe, Milton Wolpin: 1968.

3—The Meaning of Dreams: Recent Insights from the Laboratory, edited by Jerome Fisher and Louis Breger: 1969.

4—The Establishment and Administration of Operant Conditioning Programs in a State Hospital for the Retarded, edited by Thomas S. Ball: 1969.

CALIFORNIA MENTAL HEALTH TRAINING MONOGRAPH

1—Preparation for Training for Community Psychiatry, by Arnold Beisser: 1967.

RONALD REAGAN *Governor*	WILLIAM C. JENKINS *Deputy Director*
JAMES V. LOWRY, M.D. *Director*	HERBERT DÖRKEN, Ph.D. *Chief of Research*